AD A091088

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REPORT DOCUMENTATION PAGE

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Susquehanna River Basin, Chenango County, NY
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7. AUTHOR(s): George Koch

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Albany, NY 12233

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Chenango County
Susquehanna River

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and a visual inspection of the Mill Brook Site 1 Dam did not reveal conditions which constitute a hazard to human life or property.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

The total discharge capacity of the spillways is adequate to impound and safely discharge the floodwaters resulting from the Probable Maximum Flood (PMF).

Several minor deficiencies were noted which should be corrected within 6 months of the date of final approval of this report. The required actions are establishing a good grass cover on the upstream slope, repairing the sloughing on the outer auxiliary spillway slope, and regrading the eroded area at the end of the rock sill on the downstream end of the auxiliary spillway channel. In addition, an emergency action plan for notification of downstream residents should be developed within the same time frame.

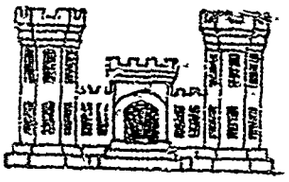
SUSQUEHANNA RIVER BASIN

MILLBROOK WATERSHED PROJECT

SITE 1

CHENANGO COUNTY, NEW YORK
INVENTORY NO. N.Y. 715

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



DACW-51-79-C-0001

NEW YORK DISTRICT CORPS OF ENGINEERS

AUGUST, 1980

CONTRACT NO. DACW-51-79-C0001

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MILL BROOK WATERSHED PROJECT SITE I I.D. No. NY-715
(#117B-4340 SUSQUEHANNA RIVER BASIN)
CHENANGO COUNTY

TABLE OF CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Mill Brook Watershed Project Site 1 I.D. No. NY-715
State Located:	New York
County Located:	Chenango
Watershed:	Susquehanna River Basin
Date of Inspection:	July 31, 1980

ASSESSMENT

The examination of documents and a visual inspection of the Mill Brook Site 1 Dam did not reveal conditions which constitute a hazard to human life or property.

The total discharge capacity of the spillways is adequate to impound and safely discharge the floodwaters resulting from the Probable Maximum Flood (PMF).

Several minor deficiencies were noted which should be corrected within 6 months of the date of final approval of this report. The required actions are establishing a good grass cover on the upstream slope, repairing the sloughing on the outer auxiliary spillway slope, and regrading the eroded area at the end of the rock sill on the downstream end of the auxiliary spillway channel. In addition, an emergency action plan for notification of downstream residents should be developed within the same time frame.

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:

Colonel W. M. Smith Jr.
New York District Engineer

Date: 30 Sep 80

OVERVIEW
MILL BROOK WATERSHED PROJECT
SITE 1
I.D. No. NY-715

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MILL BROOK WATERSHED PROJECT
SITE 1
I.D. No. NY-715
(#117B-4340)
SUSQUEHANNA RIVER BASIN
CHENANGO COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Mill Brook Watershed Project Site 1 Dam consists of an earth dam with a service spillway pipe passing through the embankment and an excavated auxiliary spillway passing around the southern end of the dam.

The dam consists of a compacted earth embankment which is 52 feet high, has a crest length of 475 feet and a crest width of 14 feet. The upstream slope is 1 vertical on 3.5 horizontal with a 10 foot wide berm near the base of the slope. The downstream slope is 1 vertical on 2.5 horizontal with a 12 foot wide berm at approximately the mid-point of the slope. Below the berm, the slope flattens to a 1 on 3 (V:H). The crest and exposed slopes are covered with grass. An earth cutoff trench of varying depth and width keys the embankment into the foundation soils.

The service spillway consists of a rectangular reinforced concrete drop inlet structure, a 30 inch diameter reinforced concrete pipe with anti-seepage collars and a riprapped plunge pool. A reservoir drain consisting of an 18 inch diameter concrete pipe extends from the upstream toe of the embankment to the base of the spillway riser. A vertical slide gate mechanism mounted along the inside of the riser controls the flow through the reservoir drain. The auxiliary spillway is an earth cut with a bottom width of 100 feet.

An internal drainage system consisting of a gravel and stone filter is located at the base of the embankment near the downstream toe. Seepage is conducted through this drain to beyond the toe of the embankment via twin 6 inch diameter asbestos-cement pipes.

b. Location

The Mill Brook Watershed Project Site 1 dam is located off the Sherburne Turnpike in the Town of New Berlin. The structure is approximately 1 mile north-west of the Village of New Berlin.

c. Size Classification

The dam is 52 feet high and has a maximum storage capacity of almost 400 acre-feet. Therefore, the dam is in the intermediate size category as defined by the "Recommended Guidelines for Safety Inspection of Dams."

d. Hazard Classification

This dam is classified as "high" hazard due to the presence of a number of homes in the Village of New Berlin located downstream of the dam.

e. Ownership

The dam is owned by Chenango County, New York. The contracting officer is Mr. Phillip Cummings whose telephone number is (607)334-4632.

f. Purpose of Dam

The dam is a floodwater retarding structure.

g. Design and Construction History

The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). The SCS office at the Broome County Airport has a design folder containing hydrologic, hydraulic and structural design information. The dam was constructed between 1977 and 1979 by J.R. Hall, Inc. of Waterville,New York. The Howdy Jones Construction Company was the earthwork subcontractor for the structure.

h. Normal Operating Procedures

Normal flows are discharged through the service spillway. This structure has sufficient capacity to store and discharge a 100 year flood without discharge occuring in the auxiliary spillway. For storms in excess of the 100 year flood, discharge through the auxiliary spillway can be expected.

1.3 PERTINENT DATA

a. Drainage Area (acres)	1338
b. Discharge at Dam (cfs)	
Service Spillway at maximum high water	158
Service Spillway at auxiliary spillway crest elev.	144
Auxiliary Spillway at maximum high water	8850
Reservoir drain at service spillway crest elevation	79

c. Elevation(USGS Datum)

Top of Dam	1349.0
Auxiliary Spillway Crest	1339.5
Service Spillway Crest	1306.3
Reservoir Drain (invert elevation)	1302.0

d. Reservoir Surface Area (acres)

Top of Dam	22.7
Auxiliary Spillway Crest	15.0
Service Spillway Crest	0.9

e. Storage Capacity (acre-feet)

Top of Dam	397.9
Auxiliary Spillway Crest	222.6
Service Spillway Crest	2.2

f. Dam

Embankment type - A compacted earth fill with a keyed earth cut-off trench, and a drain parallel to the axis of dam

Embankment length (ft) 475

Slopes - Upstream 1 vertical on 3.5 horizontal
Downstream 1 vertical on 2.5 horizontal with 12 foot wide berm - slope below berm is 1 vertical on 3 horizontal

Crest Width (ft) 14

g. Service Spillway

Type: Ungated, reinforced concrete drop inlet (2.5 x 7.5 ft), rising 8.3 feet above the invert of the 30 inch diameter concrete conduit; length of conduit 340 feet

Weir length (ft). 15

h. Auxiliary Spillway

Type: An excavated, trapezoidal channel with a grass lining.

Bottom Width (ft)	100
Side Slopes (V:H)	1:3
Exit Slope (ft/ft)	0.02

i. Reservoir Drain

Type: 18 inch diameter reinforced concrete pipe

Control: Manually operated vertical slide gate mounted along the inside of the service spillway riser.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Mill Brook Watershed Project Site 1 Dam is located in the glaciated portion of the Appalachian uplands (northern extreme of the Appalachian Plateau) physiographic province of New York State. These uplands were formed by dissection of the uplifted but flat lying sandstones and shales of the Middle and Upper Catskill Delta. The plateau surface is represented by flat-topped divides with drainage generally southwest toward the Susquehanna River system. The bedrock in the vicinity of this dam is predominantly shale.

The present surficial deposits consist of a thin layer of topsoil over glacial till. There is a small amount of outwash and alluvial gravel in the vicinity of the present stream channel. These deposits have resulted from glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

A subsurface investigation program was conducted by SCS. The initial test pits and drill holes were progressed in 1969 and a supplemental program was undertaken in 1977. A total of 17 borings and 14 test pits were taken at locations along the dam, auxiliary spillway, structural elements and borrow area. Applicable subsurface information has been included in Appendix F.

The centerline of the structure was shifted a short distance downstream from the originally proposed location because of foundation conditions encountered during the drilling program. In general, the foundation consists of glacial till over bedrock. The depth to bedrock in the vicinity of the dam varies from 5' to 50 feet. The soils encountered varied from slightly to moderately permeable.

2.2 DESIGN RECORDS

This dam was designed by the Soil Conservation Service, who prepared a design report. A folder containing the design report and other design information was available at the SCS office at the Broome County Airport. Twenty four drawings, several of which have been included in Appendix F, were prepared for the construction of this dam.

2.3 CONSTRUCTION RECORDS

Complete construction records are available from the SCS office at the Broome County Airport. Several changes from the original design were made during construction. These changes have been indicated on the as-built plans shown in Appendix F. Among the changes were the flattening of the southern cut slope which forms the auxiliary spillway and the addition of rock creases at the embankment-abutment interface.

2.4 OPERATION RECORDS

Since the dam is an uncontrolled, floodwater retarding structure, no operating records are maintained regarding water levels. However, during periods of heavy rainfall, SCS personnel do monitor reservoir levels.

2.5 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from the Soil Conservation Service as well as the New York State Department of Environmental Conservation files. It appears to be adequate and reliable for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Site 1 dam was conducted on July 31, 1980. The weather was clear and the temperature was in the seventies. The water surface at the time of the inspection was 3.74 feet below the top of the concrete riser.

b. Embankment

No signs of distress were observed in the earth embankment and no evidence of seepage, misalignment, subsidence or surface cracking were noted on the embankment. The only deficiencies noted were of a minor nature and most were related to the fact that construction of the dam was completed only last September. The grass cover on the upstream slope had not yet established itself. There was minor rill erosion between the top of the riser and the northern abutment contact. There was also some minor erosion on the lower portion of the downstream slope between the principal spillway outlet pipe and the northern abutment.

An internal drainage system composed of 2 - 6 inch diameter pipes surrounded by drain-fill material provides drainage at the base of the embankment. At the time of the inspection, there was no flow coming from the pipes. However, Gary Page of SCS reported that the drains had operated during the construction of the dam.

c. Service Spillway

The service spillway consists of a vertical drop inlet structure, a reinforced concrete pipe and a plunge pool at the conduit outlet. The elements which were visible appeared to be in good condition. The pipe interior had been closely inspected in June of 1980 by Mr. Page. His inspection indicated that the maximum joint extensibility along the conduit was three-quarters of an inch. This compares favorably with the maximum closure achieved during construction of one-half inch.

d. Auxiliary Spillway

The auxiliary spillway is located in an earth cut at the southern end of the dam. The cut slope on the outside of the channel was sloughing in several areas. This sloughing was caused by water coming out of the hillside. The downstream portion of this slope had been flattened during construction in an attempt to remedy these problems. However, even in the flattened area there were several locations where sloughing was observed. In addition, there was some erosion at the end of the rock sill which extends across the downstream end of the auxiliary spillway channel.

e. Reservoir Drain

The 18 inch diameter reservoir drain and manually operated slide gate may be used to lower the reservoir. The drain was reported to be operational.

f. Reservoir

There were no signs of serious soil instability in the reservoir area. However, there was a minor sedimentation delta in the reservoir from an old haul road which extends into the pool.

g. Downstream Channel

The downstream channel below the plunge pool was gravel and stone filled for a distance. Beyond the area which was disturbed by construction, the channel was cut into natural ground. Trees and heavy brush were growing at the edge of the channel.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection of this dam revealed the following deficiencies:

1. The grass cover on the upstream slope was relatively sparse.

2. There was substantial sloughing on the outside cut slope of the auxiliary spillway channel.

3. There was some erosion at the end of the rock sill at the downstream end of the auxiliary spillway channel.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is at the crest of the principal spillway riser. Downstream flows are limited by flow into the riser, except during periods of extremely heavy runoff when the auxiliary spillway is in service.

4.2 MAINTENANCE OF DAM

The dam is maintained by the owner. Construction of the dam was completed in September 1979. The grass on the upstream slope has not come in uniformly and might need further attention. In other respects, the dam appeared to be satisfactorily maintained.

4.3 WARNING SYSTEM IN EFFECT

There is no warning system in effect.

4.4 EVALUATION

The operation and maintenance procedures for this dam are satisfactory.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the 1338 acre watershed of the Site 1 dam was made using the USGS 7.5 minute quadrangles for New Berlin North and Sherburne, New York. The watershed consists of open grassed fields and woodlands. Relief in the drainage area ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

The analysis of the floodwater retarding capability of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. This program develops an inflow hydrograph using the Snyder Synthetic Unit Hydrograph method and then uses the "Modified Puls" flood routing procedure. The spillway design flood selected was the Probable Maximum Flood (PMF) in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The principal and auxiliary spillways are uncontrolled structures. The capacities for both spillways were taken from the stage-discharge data included in the SCS design report.

The spillways have sufficient capacity for discharging the peak outflow from the PMF. For this storm, the peak inflow is 3584 cfs and the peak outflow is 3542 cfs. When the spillways are discharging the peak outflow, the water surface will be 4.5 feet below the top of the dam. Further information concerning this analysis is included in Appendix C.

5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the principal and auxiliary spillways is 220.4 acre-feet which is equivalent to a runoff depth of 2.0 inches over the drainage area. Surcharge storage capacity to the maximum high water elevation is an additional 175.3 acre-feet, equivalent to a runoff depth over the drainage area of 1.6 inches. Total storage capacity of the dam is 397.9 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood occurred during March, 1978 while the dam was under construction. The pool level at this time was reported to be about elevation 1323.5. No higher water has been recorded since the dam was completed in September, 1979.

5.6 OVERTOPPING POTENTIAL

Analysis indicates that the total discharge capacity is sufficient to prevent overtopping from the PMF.

5.7 EVALUATION

This dam has sufficient capability to impound and adequately discharge floodwaters expected to result from the PMF.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of distress were observed in connection with the earth embankment.

b. Design and Construction Data

Design data was obtained from SCS. Stability analyses were performed using the Swedish circle method of analysis. Two undrained triaxial shear tests were performed on compacted soil samples from the proposed borrow area. These tests were used to select soil parameters for use in the analysis. Several cases were analyzed on the upstream slope. For rapid drawdown from the permanent pool elevation, the minimum factor of safety was 1.45. For rapid-draw down from the water surface which would result from the 100 year storm, the factor of safety was 1.2. While this is lower than desireable, it is acceptable due to the low frequency of occurrence of this storm. For the downstream slope, long term steady seepage was analyzed. The minimum factor of safety for this case was 1.34.

c. Seismic Stability

No records of any seismic stability analysis performed for this structure could be located.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Mill Brook Site 1 Dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable and the spillways are capable of retarding and safely discharging floodwaters resulting from the Probable Maximum Flood (PMF).

b. Adequacy of Information

Information reviewed for Phase I inspection purposes is considered to be adequate.

c. Need for Additional Investigations

No additional investigations are necessary at this time.

7.2 RECOMMENDED MEASURES

The following actions should be taken within 6 months of the date of final approval of this report:

a. Take actions which will assist in the development of a good grass cover on the upstream slope.

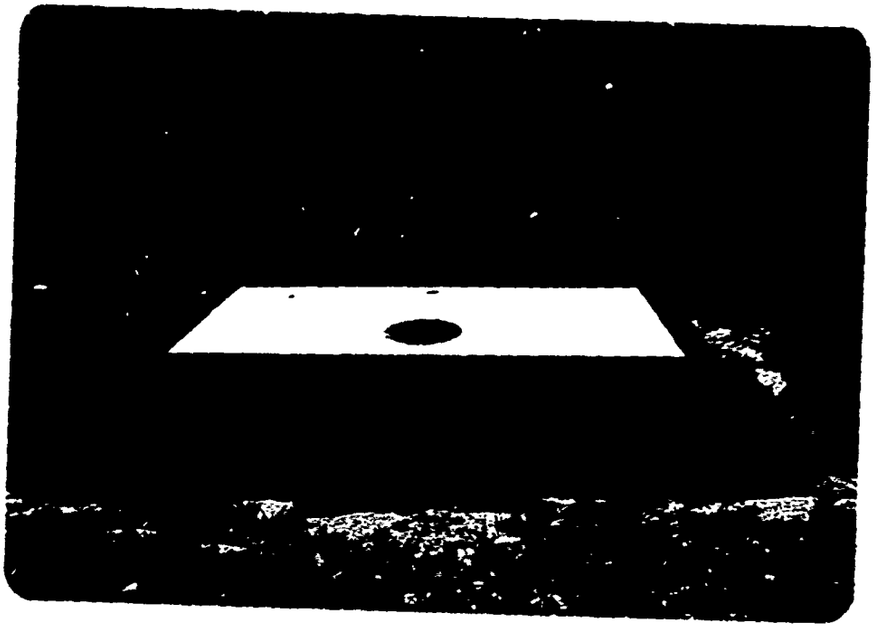
b. Investigate the sloughing on the outside cut slope of the auxiliary spillway channel and take actions necessary to correct this problem.

c. Repair the erosion at the end of the rock sill at the downstream end of the auxiliary spillway channel.

. Develop an emergency action plan for notification of downstream residents and the proper authorities in the event of large auxiliary spillway discharges.

APPENDIX A

PHOTOGRAPHS



Service Spillway Riser

Upstream Slope of Dam and Service
Spillway Riser

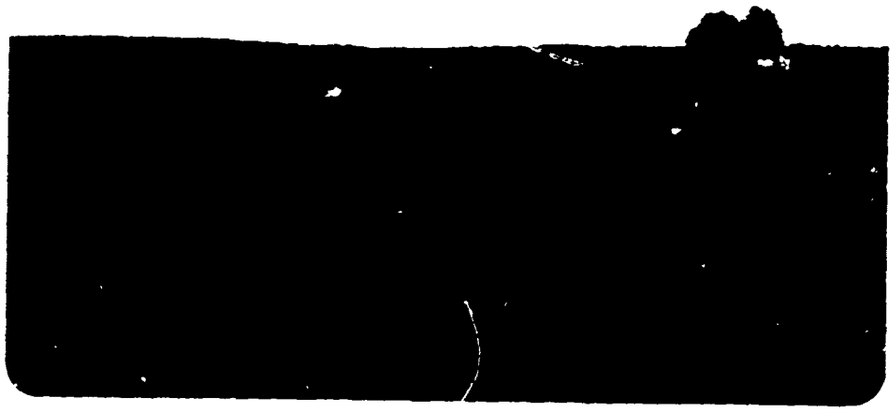
Downstream Slope - Auxiliary Spillway
Channel in Background

Outlets of Principal Spillway Conduit
and Drainage System Pipes

Crest of Dam Looking Across
Auxiliary Spillway Channel

Rock Trench Carrying Flow Off
Road into Pool, Slight Delta Forming at Toe

Auxiliary Spillway Channel Looking Downstream
Note Sloughing on Slope



Sloughing on Outer Slope of Auxiliary
Spillway Channel

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam MILL BROOK WATERSHED PROJECT SITE 1

Fed. I.D. # NY 715 DEC Dam No. 117B-4340

River Basin SUSQUEHANNA

Location: Town NEW BERLIN County CHENANGO

Stream Name MILL BROOK

Tributary of UNADILLA RIVER

Latitude (N) 42° 37.9' Longitude (W) 75° 20.8'

Type of Dam EARTH EMBANKMENT

Hazard Category C

Date(s) of Inspection JULY 31, 1980

Weather Conditions SUNNY 75°

Reservoir Level at Time of Inspection 3.74' BELOW TOP OF RISER

b. Inspection Personnel W. LYNICK R. WARRENDER

c. Persons Contacted (Including Address & Phone No.)

GARY PAGE - SCS BROOME CO. AIRPORT OFFICE

607-773-2751

d. History:

Date Constructed 9/79 COMPLETED Date(s) Reconstructed

Designer SOIL CONSERVATION SERVICE

Constructed By J.R. HALL INC.-WATERVILLE, N.Y. SUB- HOWAY JONES CONST. (EARTH)

Owner CHENANGO COUNTY

2) Embankment

a. Characteristics

(1) Embankment Material COMPACTED TILL

(2) Cutoff Type COMPACTED EARTH

(3) Impervious Core NONE

(4) Internal Drainage System YES

(5) Miscellaneous GRASS COVER - NO CROWNVETCH AVAILABLE AT TIME OF CONSTRUCTION

b. Crest

(1) Vertical Alignment GOOD

(2) Horizontal Alignment CURVED

(3) Surface Cracks NONE

(4) Miscellaneous

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1 ON 3

(2) Undesirable Growth or Debris, Animal Burrows NONE - GRASS COVER WAS SOMEWHAT SPARSE

(3) Sloughing, Subsidence or Depressions MINOR RILL EROSION BETWEEN TOP OF RISER & NORTH ABUTMENT CONTACT & AROUND RISER AREA ON SLOPE

(4) Slope Protection NONE

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 ON 2 UPPER 1 ON 3 LOWER

(2) Undesirable Growth or Debris, Animal Burrows NONE

(3) Sloughing, Subsidence or Depressions MINOR EROSION RILL ON LOWER BERM SLOPE (½ WAY BETWEEN PIPE & NORTH ABUTMENT)

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE

(6) External Drainage System (Ditches, ~~Trenches~~; ~~Blanket~~) RIPRAP AT ALL 4 SLOPE-ABUTMENT CONTACTS

(7) Condition Around Outlet Structure SATISFACTORY - RIPRAP

(8) Seepage Beyond Toe NONE

e. Abutments - Embankment Contact

RIPRAP ON CREASES

(1) Erosion at Contact NONE

(2) Seepage Along Contact NONE

3) Drainage System

a. Description of System 2-6" DIAMETER ASBESTOS-CEMENT PIPE WITH ANIMAL GUARDS

b. Condition of System OKAY- GARY PAGE SAID HIGH WATER DURING CONSTRUCTION CAUSED PIPES TO FLOW SUBSTANTIALLY

c. Discharge from Drainage System NONE

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

NONE

5) Reservoir

a. Slopes STEEP WITH BRUSH & TREES

b. Sedimentation MINOR DELTA AT OLD HAUL ROAD & DITCH ENTRANCE FROM RIGHT ABUTMENT AT AUXILIARY SPILLWAY ENTRANCE

c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) VILLAGE OF NEW BERLIN

b. Seepage, Unusual Growth NONE

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel HEAVY BRUSH & TREES IN STREAM

7) Spillway(s) (Including Discharge Conveyance Channel)

a. General CONCRETE RISER → CONDUIT → PLUNGE POOL FOR SERVICE SPILLWAY

AUXILIARY SPILLWAY - CHANNEL IN EARTH CUT

b. Condition of Service Spillway SATISFACTORY

GARY PAGE CRAWLED PIPE IN JUNE, 1980 - HE SAID MAXIMUM JOINT EXTENSIBILITY WAS 3/4" - THE MAXIMUM CLOSURE AT THE TIME OF CONSTRUCTION WAS 1/2". MOST OF THE JOINTS HAD < 3/8" GAP.

c. Condition of Auxiliary Spillway SLOUGHING ON OUTSIDE CUT SLOPE (CAUSED BY HILLSIDE SEEPAGE 2 MONTHS EACH YEAR). SLOPE WAS FLATTENED DURING CONSTRUCTION ON PART OF CHANNEL BUT THERE WAS STILL MINOR SLOUGHING IN FLAT AREA

ROCK SILL AT OUTLET TO AUX. SPILLWAY WAS ERODED AT ONE END

d. Condition of Discharge Conveyance Channel

DOWNSTREAM OF SITE - HEAVY BRUSH & TREES LINING EXISTING STREAM

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete ✓ Metal _____ Other _____

Size: 18" Length 30'

Invert Elevations: Entrance 1302.0 Exit 1302.0

Physical Condition (Describe): Unobservable ✓

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate ✓ Valve _____ Uncontrolled _____

Operation: Operable ✓ Inoperable _____ Other _____

Present Condition (Describe): _____

REPORTED TO BE OPERATIONAL

9) Structural

a. Concrete Surfaces ALL SATISFACTORY

b. Structural Cracking NONE

c. Movement - Horizontal & Vertical Alignment (Settlement)
NONE

d. Junctions with Abutments or Embankments GOOD

e. Drains - Foundation, Joint, Face

f. Water Passages, Conduits, Sluices SLIGHT SEPARATION OF SOME JOINTS

g. Seepage or Leakage NONE

h. Joints - Construction, etc. NONE

i. Foundation OKAY

j. Abutments OKAY

k. Control Gates

l. Approach & Outlet Channels

m. Energy Dissipators (Plunge Pool, etc.) RIP RAP PLUNGE POOL

n. Intake Structures GOOD CONDITION

o. Stability

p. Miscellaneous

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1349.0	22.7	397.9
2) Design High Water (Max. Design Pool)			
3) Auxiliary Spillway Crest	1339.5	15.0	222.6
4) Pool Level with Flashboards			
5) Service Spillway Crest	1306.3	0.9	2.2

DISCHARGES

	Volume (cfs)
1) Average Daily	
2) Spillway @ Maximum High Water	158.4
3) Spillway @ Design High Water	
4) Spillway @ Auxiliary Spillway Crest Elevation	143.5
5) Low Level Outlet	79.2
6) Total (of all facilities) @ Maximum High Water	9009
7) Maximum Known Flood	
8) At Time of Inspection	

CREST: ELEVATION: 1349.0

Type: GRASSED EARTH

Width: 16' Length: 475'

Spillover AUXILIARY CHANNEL

Location SOUTH END OF DAM

SPILLWAY:

PRINCIPAL		EMERGENCY
1306.3	Elevation	1339.5
R/C DROP INLET	Type	EARTH CUT CHANNEL
WEIR LENGTH 15'	Width	100'
	Type of Control	
✓	Uncontrolled	✓
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

_____

Method of Controlled Releases (mechanisms):

RESERVOIR DRAIN

_____

DRAINAGE AREA: 2.09 Sq.M.

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FARMS, WOODLANDS

Terrain - Relief: GRASS - FORESTS

Surface - Soil: TILL

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

CONSTRUCTION ROAD GOES INTO RESERVOIR

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

NONE

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: _____

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

09-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
Mill Brook Watershed Project	1		
SUBJECT		**COMPUTED BY**	**DATE**
Hydrologic/Hydraulic Computations		RLJ	

DRAINAGE AREA = 2.09 SQ MI = 1338 ACRES

SNYDER SYNTHETIC UNIT HYDROGRAPH

$L = 2.46$ mi $L_{ca} = 1.21$ mi

$t_p = C_t (L \cdot L_{ca})^{.3} = 2.0 (2.46)(1.21)^{.3} = 2.77$

$t_r = \frac{t_p}{5.5} = \frac{2.77}{5.5} = .50$ USE ½ HOUR INCREMENTS

$t_{pR} = t_p + .25 (t_R - t_r) = 2.77 + .25 (.5 - .5) = 2.77$

HR #33 PMP RAINFALL

ZONE 1 PMP RAIN = 20 IN

6 HR = 111% 24 HR = 133%

12 HR = 123% 48 HR = 142%

$TRSPC = 1 - \frac{.3008}{(2.09)^{.1477}} = .74$

BASE FLOW - USE 2 cfs

```
**********                                                    **********
FLOOD HYDROGRAPH PACKAGE (HEC-1)                              NEW YORK STATE
DAM SAFETY VERSION     JULY 1978                              DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                                FLOOD PROTECTION BUREAU
  MODIFIED FOR HOMEWELL APR 79
**********                                                    **********
    1             A1 MILL BROOK WATERSHED PROJECT  SITE 1
    2             A2  ANALYSIS  PMF WITH RATIOS
    3             A3  DATE
    4             B    200        0       30        0        0        0        C        2        0        0
    5             B1     5
    6             J      1        2        1
    7             J1    .5        1
    8             K      C        1                                          1
    9             K1           INFLOW HYDROGRAPH
   10             M      1        1    2.09                          .74                  1
   11             P      C       20     111      123      132      142
   12             T                                                   1       .1
   13             W   2.77     .625
   14             X      2        2        1
   15             K      1        1                                          1
   16             K1   ROUTED HYDROGRAPH AT DAM NO BREACH
   17             Y                                 1        1
   18             Y1     1                                          -1306.3       -1
   19             Y41306.3  1339.5   1343.1   1348.9
   20             Y5     C      129     1834     9009
   21             $S   2.2   222.6    281.2    397.9
   22             $E1306.3  1339.5   1343.1   1348.9
   23             $$1306.3
   24             $C1348.9      2.6      1.5      475
   25             K     99
   26             A
   27             A
   28             A
   29             A
   30             A
```

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
(A SAFETY VERSION) JULY 1978
LAST MODIFICATION 26 FEB 79
MODIFIED FOR HONEYWELL APR 79
****

****
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
****

RUN DATE 07/28/80

MILL BROOK WATERSHED PROJECT SITE 1
ANALYSIS PMF WITH RATIOS
DATE

JOB SPECIFICATION

NC	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
200	0	30	0	0	0	0	2	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 2 LRTIO= 1
RTIOS= 0.50 1.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.09	0.	2.09	0.74	0.	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.	20.00	111.00	123.00	132.00	142.00	0.	0.

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.	0.	1.00	0.	0.	1.00	1.00	0.10	0.	0.

UNIT HYDROGRAPH DATA
TP= 2.77 CP=0.63 NTA= 0

RECESSION DATA
STRTQ= 2.00 QRCSN= 2.00 RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 6.41 AND R= 5.12 INTERVALS

UNIT HYDROGRAPH 31 END-OF-PERIOD ORDINATES, LAG= 2.79 HOURS, CP= 0.63 VOL= 1.00

21.	76.	150.	226.	282.	305.	285.	240.	197.	162.
133.	110.	90.	74.	61.	50.	41.	34.	28.	23.
19.	15.	13.	10.	9.	7.	6.	5.	4.	3.
3.									

0
END-OF-PERIOD FLOW

HO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	HO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.30	1	0.00	0.	0.00	2.	1.03	2.30	101	0.	0.	0.	263.
1.01	1.00	2	0.00	0.	0.00	2.	1.03	3.00	102	0.	0.	0.	217.
1.01	1.30	3	0.00	0.	0.00	2.							

1.01	2.30	5	0.00	0.	0.00	2.	1.03	4.00	104	0.	0.	0.	145.
1.01	3.00	6	0.00	0.	0.00	2.	1.03	4.30	105	0.	0.	0.	118.
1.01	3.30	7	0.00	0.	0.00	2.	1.03	5.00	106	0.	0.	0.	95.
1.01	4.00	8	0.00	0.	0.00	2.	1.03	5.30	107	0.	0.	0.	77.
1.01	4.30	9	0.00	0.	0.00	2.	1.03	6.00	108	0.	0.	0.	61.
1.01	5.00	10	0.00	0.	0.00	2.	1.03	6.30	109	0.	0.	0.	48.
1.01	5.30	11	0.00	0.	0.00	2.	1.03	7.00	110	0.	0.	0.	37.
1.01	6.00	12	0.00	0.	0.00	2.	1.03	7.30	111	0.	0.	0.	20.
1.01	6.30	13	0.01	0.	0.01	2.	1.03	8.00	112	0.	0.	0.	15.
1.01	7.00	14	0.01	0.	0.01	2.	1.03	8.30	113	0.	0.	0.	10.
1.01	7.30	15	0.01	0.	0.01	2.	1.03	9.00	114	0.	0.	0.	7.
1.01	8.00	16	0.01	0.	0.01	2.	1.03	9.30	115	0.	0.	0.	4.
1.01	8.30	17	0.01	0.	0.01	2.	1.03	10.00	116	0.	0.	0.	4.
1.01	9.00	18	0.01	0.	0.01	2.	1.03	10.30	117	0.	0.	0.	3.
1.01	9.30	19	0.01	0.	0.01	2.	1.03	11.00	118	0.	0.	0.	3.
1.01	10.00	20	0.01	0.	0.01	2.	1.03	11.30	119	0.	0.	0.	3.
1.01	10.30	21	0.01	0.	0.01	2.	1.03	12.00	120	0.	0.	0.	3.
1.01	11.00	22	0.01	0.	0.01	2.	1.03	12.30	121	0.	0.	0.	2.
1.01	11.30	23	0.01	0.	0.01	2.	1.03	13.00	122	0.	0.	0.	2.
1.01	12.00	24	0.01	0.	0.01	2.	1.03	13.30	123	0.	0.	0.	2.
1.01	12.30	25	0.06	0.	0.06	2.	1.03	14.00	124	0.	0.	0.	2.
1.01	13.00	26	0.06	0.	0.06	2.	1.03	14.30	125	0.	0.	0.	2.
1.01	13.30	27	0.07	0.	0.07	2.	1.03	15.00	126	0.	0.	0.	2.
1.01	14.00	28	0.07	0.	0.07	2.	1.03	15.30	127	0.	0.	0.	2.
1.01	14.30	29	0.09	0.	0.09	2.	1.03	16.00	128	0.	0.	0.	2.
1.01	15.00	30	0.09	0.	0.09	2.	1.03	16.30	129	0.	0.	0.	2.
1.01	15.30	31	0.11	0.	0.11	2.	1.03	17.00	130	0.	0.	0.	2.
1.01	16.00	32	0.36	0.09	0.27	4.	1.03	17.30	131	0.	0.	0.	2.
1.01	16.30	33	0.09	0.04	0.05	10.	1.03	18.00	132	0.	0.	0.	2.
1.01	17.00	34	0.09	0.04	0.05	20.	1.03	18.30	133	0.	0.	0.	2.
1.01	17.30	35	0.07	0.02	0.05	32.	1.03	19.00	134	0.	0.	0.	2.
1.01	18.00	36	0.07	0.02	0.05	44.	1.03	19.30	135	0.	0.	0.	2.
1.01	18.30	37	0.01	0.	0.01	53.	1.03	20.00	136	0.	0.	0.	2.
1.01	19.00	38	0.01	0.	0.01	57.	1.03	20.30	137	0.	0.	0.	2.
1.01	19.30	39	0.01	0.	0.01	56.	1.03	21.00	138	0.	0.	0.	2.
1.01	20.00	40	0.01	0.	0.01	51.	1.03	21.30	139	0.	0.	0.	2.
1.01	20.30	41	0.01	0.	0.01	44.	1.03	22.00	140	0.	0.	0.	2.
1.01	21.00	42	0.01	0.	0.01	37.	1.03	22.30	141	0.	0.	0.	2.
1.01	21.30	43	0.01	0.	0.01	31.	1.03	23.00	142	0.	0.	0.	2.
1.01	22.00	44	0.01	0.	0.01	26.	1.03	23.30	143	0.	0.	0.	2.
1.01	22.30	45	0.01	0.	0.01	22.	1.04	0.	144	0.	0.	0.	2.
1.01	23.00	46	0.01	0.	0.01	18.	1.04	0.30	145	0.	0.	0.	2.
1.01	23.30	47	0.01	0.	0.01	15.	1.04	1.00	146	0.	0.	0.	2.
1.02	0.	48	0.01	0.	0.01	13.	1.04	1.30	147	0.	0.	0.	2.
1.02	0.30	49	0.04	0.	0.04	11.	1.04	2.00	148	0.	0.	0.	2.
1.02	1.00	50	0.04	0.	0.04	9.	1.04	2.30	149	0.	0.	0.	2.
1.02	1.30	51	0.04	0.	0.04	8.	1.04	3.00	150	0.	0.	0.	2.
1.02	2.00	52	0.04	0.	0.04	7.	1.04	3.30	151	0.	0.	0.	2.
1.02	2.30	53	0.04	0.	0.04	6.	1.04	4.00	152	0.	0.	0.	2.
1.02	3.00	54	0.04	0.	0.04	5.	1.04	4.30	153	0.	0.	0.	2.
1.02	3.30	55	0.04	0.	0.04	5.	1.04	5.00	154	0.	0.	0.	2.
1.02	4.00	56	0.04	0.	0.04	4.	1.04	5.30	155	0.	0.	0.	2.
1.02	4.30	57	0.04	0.	0.04	4.	1.04	6.00	156	0.	0.	0.	2.
1.02	5.00	58	0.04	0.	0.04	4.	1.04	6.30	157	0.	0.	0.	2.
1.02	5.30	59	0.04	0.	0.04	3.	1.04	7.00	158	0.	0.	0.	2.
1.02	6.00	60	0.04	0.	0.04	3.	1.04	7.30	159	0.	0.	0.	2.
1.02	6.30	61	0.15	0.10	0.05	5.	1.04	8.00	160	0.	0.	0.	2.
1.02	7.00	62	0.15	0.10	0.05	12.	1.04	8.30	161	0.	0.	0.	2.
1.02	7.30	63	0.15	0.10	0.05	27.	1.04	9.00	162	0.	0.	0.	2.
1.02	8.00	64	0.15	0.10	0.05	49.	1.04	9.30	163	0.	0.	0.	2.
1.02	8.30	65	0.15	0.10	0.05	76.	1.04	10.00	164	0.	0.	0.	2.
1.02	9.00	66	0.15	0.10	0.05	106.	1.04	10.30	165	0.	0.	0.	2.
1.02	9.30	67	0.15	0.10	0.05	134.	1.04	11.00	166	0.	0.	0.	2.
1.02	10.00	68	0.15	0.10	0.05	157.	1.04	11.30	167	0.	0.	0.	2.
1.02	10.30	69	0.15	0.10	0.05	177.	1.04	12.00	168	0.	0.	0.	2.
							1.04	12.30	169	0.	0.	0.	2.

1.02	11.00	70	0.15	0.10	0.05	193.	1.04	13.00	170	0.	0.	0.	2.
1.02	11.30	71	0.15	0.10	0.05	206.	1.04	13.30	171	0.	0.	0.	2.
1.02	12.00	72	0.15	0.10	0.05	217.	1.04	14.00	172	0.	0.	0.	2.
1.02	12.30	73	0.82	0.77	0.05	239.	1.04	14.30	173	0.	0.	0.	2.
1.02	13.00	74	0.82	0.77	0.05	298.	1.04	15.00	174	0.	0.	0.	2.
1.02	13.30	75	0.99	0.94	0.05	409.	1.04	15.30	175	0.	0.	0.	2.
1.02	14.00	76	0.99	0.94	0.05	578.	1.04	16.00	176	0.	0.	0.	2.
1.02	14.30	77	1.23	1.18	0.05	802.	1.04	16.30	177	0.	0.	0.	2.
1.02	15.00	78	1.23	1.18	0.05	1067.	1.04	17.00	178	0.	0.	0.	2.
1.02	15.30	79	1.50	1.45	0.05	1351.	1.04	17.30	179	0.	0.	0.	2.
1.02	16.00	80	4.74	4.69	0.05	1709.	1.04	18.00	180	0.	0.	0.	2.
1.02	16.30	81	1.15	1.10	0.05	2172.	1.04	18.30	181	0.	0.	0.	2.
1.02	17.00	82	1.15	1.10	0.05	2672.	1.04	19.00	182	0.	0.	0.	2.
1.02	17.30	83	0.90	0.85	0.05	3129.	1.04	19.30	183	0.	0.	0.	2.
1.02	18.00	84	0.90	0.85	0.05	3455.	1.04	20.00	184	0.	0.	0.	2.
1.02	18.30	85	0.07	0.02	0.05	3584.	1.04	20.30	185	0.	0.	0.	2.
1.02	19.00	86	0.07	0.02	0.05	3468.	1.04	21.00	186	0.	0.	0.	2.
1.02	19.30	87	0.07	0.02	0.05	3168.	1.04	21.30	187	0.	0.	0.	2.
1.02	20.00	88	0.07	0.02	0.05	2798.	1.04	22.00	188	0.	0.	0.	2.
1.02	20.30	89	0.07	0.02	0.05	2405.	1.04	22.30	189	0.	0.	0.	2.
1.02	21.00	90	0.07	0.02	0.05	2019.	1.04	23.00	190	0.	0.	0.	2.
1.02	21.30	91	0.07	0.02	0.05	1673.	1.04	23.30	191	0.	0.	0.	2.
1.02	22.00	92	0.07	0.02	0.05	1384.	1.05	0.	192	0.	0.	0.	2.
1.02	22.30	93	0.07	0.02	0.05	1146.	1.05	0.30	193	0.	0.	0.	2.
1.02	23.00	94	0.07	0.02	0.05	950.	1.05	1.00	194	0.	0.	0.	2.
1.02	23.30	95	0.07	0.02	0.05	789.	1.05	1.30	195	0.	0.	0.	2.
1.03	0.	96	0.07	0.02	0.05	657.	1.05	2.00	196	0.	0.	0.	2.
1.03	0.30	97	0.	0.	0.	548.	1.05	2.30	197	0.	0.	0.	2.
1.03	1.00	98	0.	0.	0.	457.	1.05	3.00	198	0.	0.	0.	2.
1.03	1.30	99	0.	0.	0.	381.	1.05	3.30	199	0.	0.	0.	2.
1.03	2.00	100	0.	0.	0.	317.	1.05	4.00	200	0.	0.	0.	2.
									SUM	21.02	17.41	3.61	47119.
										(534.)	(442.)	(92.)	(1334.26)

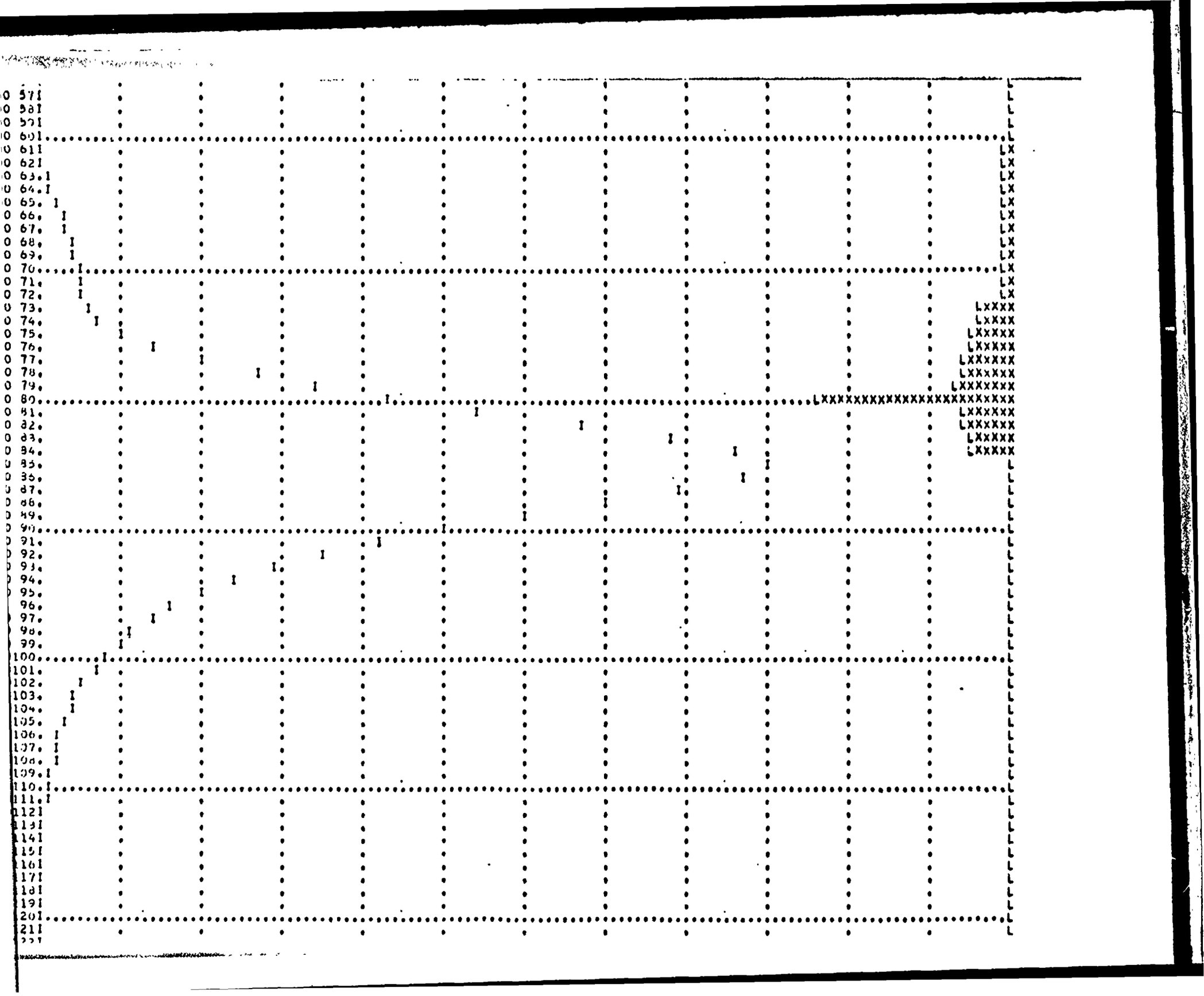
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3584.	2674.	963.	326.	47117.
CMS	101.	76.	27.	9.	1334.
INCHES		11.90	17.14	17.44	17.48
MM		302.35	435.26	442.85	443.89
AC-FT		1326.	1909.	1942.	1947.
THOUS CU M		1636.	2355.	2396.	2402.

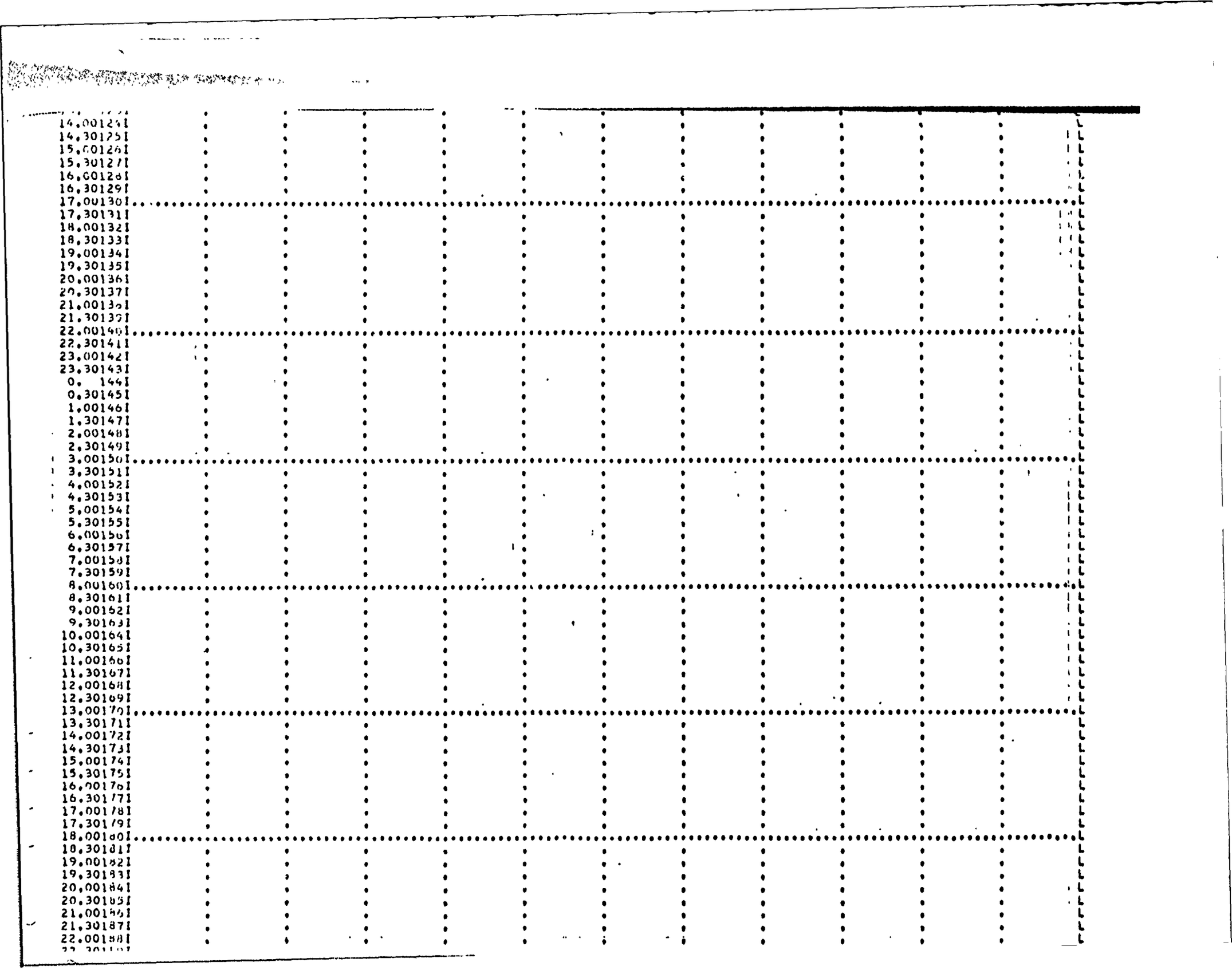
OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	400.	800.	1200.	1600.	2000.	2400.	2800.	3200.	3600.	C.	C.	0.
											PRECIP(L) AND EXCESS(X)		
	0.	0.	C.	0.	0.	0.	0.	C.	0.	6.	4.	2.	0.
0.30	1I												L
1.00	2I												L
1.30	3I												L
2.00	4I												L
2.30	5I												L
3.00	6I												L
3.30	7I												L
4.00	8I												L
4.30	9I												L
5.00	10I												L
5.30	11I												L
6.00	12I												L
6.30	13I												L
7.00	14I												L
7.30	15I												L
8.00	16I												L
8.30	17I												L
9.00	18I												L
9.30	19I												L
10.00	20I												L
10.30	21I												L
11.00	22I												L
11.30	23I												L
12.00	24I												L
12.30	25I												L
13.00	26I												L
13.30	27I												L
14.00	28I												L
14.30	29I												L
15.00	30I												L
15.30	31I												LX
16.00	32I												LLX
16.30	33I												L
17.00	34I												L
17.30	35.I												L
18.00	36.I												L
18.30	37.I												L
19.00	38.I												L
19.30	39.I												L
20.00	40.I												L
20.30	41.I												L
21.00	42.I												L
21.30	43.I												L
22.00	44.I												L
22.30	45.I												L
23.00	46I												L
23.30	47I												L
0.	48I												L
0.30	49I												L
1.00	50I												L
1.30	51I												L
2.00	52I												L
2.30	53I												L
3.00	54I												L
3.30	55I												L
4.00	56I												L
4.30	57I												L

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17.001301
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19.301351
20.001361
20.301371
21.001381
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22.001401
22.301411
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23.301431
0. 1441
0.301451
1.001461
1.301471
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3.001501
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6.301571
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9.301631
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11.301671
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13.301711
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14.301731
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15.301751
16.001761
16.301771
17.001781
17.301791
18.001801
18.301811
19.001821
19.301831
20.001841
20.301851
21.001861
21.301871
22.001881

OVN

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIC 1

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	5.	10.	16.	22.	27.	29.	28.	25.
22.	19.	16.	13.	11.	9.	8.	6.	6.	5.
4.	4.	3.	3.	2.	2.	2.	2.	2.	2.
2.	6.	13.	24.	39.	53.	67.	79.	88.	96.
103.	108.	120.	149.	204.	289.	401.	533.	675.	854.
1086.	1336.	1565.	1728.	1792.	1734.	1584.	1369.	1203.	1010.
837.	692.	573.	475.	394.	328.	274.	228.	191.	158.
131.	108.	89.	73.	59.	48.	38.	30.	24.	18.
10.	7.	5.	3.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1792.	1337.	481.	163.	23559.
CMS	51.	38.	14.	5.	667.
INCHES		5.95	8.57	8.72	8.74
MM		151.17	217.63	221.43	221.95
AC-FT		663.	955.	971.	973.
THOUS CU M		818.	1177.	1198.	1201.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIC 2

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	4.	10.	20.	32.	44.	53.	57.	56.	51.
44.	37.	31.	26.	22.	18.	15.	13.	11.	9.
8.	7.	6.	5.	5.	4.	4.	4.	3.	3.
5.	12.	27.	49.	76.	106.	134.	157.	177.	193.
204.	217.	239.	298.	409.	578.	802.	1067.	1351.	1709.
2172.	2672.	3129.	3455.	3584.	3466.	3168.	2798.	2405.	2019.
1673.	1384.	1146.	950.	789.	657.	548.	457.	381.	317.
263.	217.	178.	145.	118.	95.	77.	61.	48.	37.
20.	15.	10.	7.	4.	4.	3.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3584.	2674.	963.	326.	47117.
CMS	101.	76.	27.	9.	1334.
INCHES		11.90	17.14	17.44	17.48
MM		302.35	435.26	442.85	443.89
AC-FT		1326.	1909.	1942.	1947.
THOUS CU M		1636.	2355.	2396.	2402.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT DAM NO BREACH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.	0.	0.	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.	0.	0.	-1306.	-1

STAGE	1306.30	1339.50	1343.10	1348.90
FLOW	0.	129.00	1834.00	9009.00
CAPACITY=	2.	223.	281.	398.
ELEVATION=	1306.	1340.	1343.	1349.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1306.3	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWIC
1348.9	2.6	1.5	475.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	1.	1.	2.	3.	3.	4.
4.	5.	5.	5.	5.	5.	6.	6.	6.	6.
6.	6.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	6.	7.	8.	10.	11.	13.
15.	18.	20.	23.	26.	32.	39.	49.	63.	79.
101.	127.	1066.	1502.	1695.	1746.	1681.	1539.	1360.	1169.
984.	819.	679.	562.	467.	388.	323.	269.	224.	187.
155.	129.	128.	127.	126.	124.	122.	120.	118.	115.
113.	110.	108.	106.	103.	101.	98.	96.	94.	91.
89.	87.	85.	83.	81.	79.	77.	76.	74.	72.
70.	69.	67.	66.	64.	62.	61.	60.	58.	57.
55.	54.	53.	52.	50.	49.	48.	47.	46.	45.
44.	43.	42.	41.	40.	39.	38.	37.	36.	35.
35.	34.	33.	32.	31.	31.	30.	29.	29.	28.
27.	27.	26.	26.	25.	24.	24.	23.	23.	22.
22.	21.	21.	20.	20.	19.	19.	18.	18.	18.
17.	17.	16.	16.	16.	15.	15.	15.	14.	14.

STORAGE

2.	2.	2.	2.	2.	2.	2.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	4.	4.	5.	6.	7.	8.	9.
10.	10.	11.	11.	11.	12.	12.	12.	12.	12.
12.	12.	12.	11.	11.	11.	11.	11.	11.	11.

[illegible]	[illegible]	36.	41.	47.	50.	69.	86.	109.	138.
17[illegible].	220.	255.	270.	276.	278.	276.	271.	265.	258.
252.	246.	241.	237.	234.	231.	229.	227.	226.	225.
224.	222.	221.	219.	217.	214.	211.	207.	203.	199.
195.	191.	187.	182.	173.	174.	170.	166.	162.	159.
155.	151.	148.	144.	141.	138.	134.	131.	128.	125.
122.	120.	117.	114.	111.	109.	106.	104.	102.	99.
97.	95.	93.	90.	89.	86.	84.	82.	81.	79.
77.	75.	74.	72.	70.	69.	67.	66.	64.	63.
61.	60.	59.	57.	56.	55.	54.	52.	51.	50.
49.	48.	47.	46.	45.	44.	43.	42.	41.	40.
39.	38.	38.	37.	36.	35.	34.	34.	33.	32.
32.	31.	30.	30.	29.	29.	28.	27.	27.	26.

STAGE

1306.3	1306.3	1306.3	1306.3	1306.3	1306.3	1306.3	1306.3	1306.4	1306.4
1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4
1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4
1306.4	1306.4	1306.5	1306.5	1306.6	1306.7	1306.8	1307.0	1307.1	1307.3
1307.4	1307.5	1307.6	1307.6	1307.7	1307.7	1307.7	1307.7	1307.7	1307.7
1307.7	1307.7	1307.7	1307.7	1307.7	1307.7	1307.6	1307.6	1307.6	1307.6
1307.6	1307.6	1307.6	1307.7	1307.8	1308.1	1308.4	1308.8	1309.2	1309.7
1310.3	1310.8	1311.4	1312.1	1313.1	1314.4	1316.4	1319.0	1322.4	1326.7
1332.2	1339.0	1341.5	1342.4	1342.8	1342.9	1342.8	1342.5	1342.1	1341.7
1341.3	1341.0	1340.7	1340.4	1340.2	1340.0	1339.9	1339.8	1339.7	1339.6
1339.6	1339.5	1339.3	1339.0	1338.6	1339.2	1337.7	1337.2	1336.6	1336.0
1335.4	1334.7	1334.1	1333.5	1332.8	1332.2	1331.6	1331.0	1330.4	1329.8
1329.3	1328.7	1328.2	1327.7	1327.2	1326.7	1326.2	1325.8	1325.3	1324.8
1324.4	1324.0	1323.6	1323.2	1322.8	1322.4	1322.0	1321.6	1321.3	1320.9
1320.6	1320.2	1319.9	1319.6	1319.3	1319.0	1318.7	1318.4	1318.1	1317.8
1317.6	1317.3	1317.0	1316.8	1316.5	1316.3	1316.1	1315.8	1315.6	1315.4
1315.2	1315.0	1314.8	1314.6	1314.4	1314.2	1314.0	1313.9	1313.7	1313.5
1313.3	1313.2	1313.0	1312.9	1312.7	1312.6	1312.4	1312.3	1312.1	1312.0
1311.9	1311.8	1311.6	1311.5	1311.4	1311.3	1311.2	1311.1	1310.9	1310.8
1310.7	1310.6	1310.5	1310.4	1310.4	1310.3	1310.2	1310.1	1310.0	1309.9

PEAK OUTFLOW IS 1746. AT TIME 43.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1746.	1215.	413.	159.	22978.
CMS	49.	34.	12.	4.	651.
INCHES		5.41	7.36	8.48	8.52
MM		137.41	186.84	215.46	216.48
AC-FT		603.	820.	945.	950.
THOUS CU M		743.	1011.	1166.	1171.

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

```
      0.      200.      400.      600.      800.     1000.     1200.     1400.     1600.     1800.       C.       C.       0.
 0.30  11I
 1.00  21I
 1.30  31I
 2.00  41I
 2.30  51I
 3.00  61I
 3.30  71I
 4.00  81I
 4.30  91I
 5.00 101I.....................................................................................................
 5.30 111I
 6.00 121I
 6.30 131I
 7.00 141I
 7.30 151I
 8.00 161I
 8.30 171I
 9.00 181I
 9.30 191I
10.00 201I.....................................................................................................
10.30 211I
11.00 221I
11.30 231I
12.00 241I
12.30 251I
13.00 261I
13.30 271I
14.00 281I
14.30 291I
15.00 301I.....................................................................................................
15.30 311I
16.00 321I
16.30 331I
17.00 341I
17.30 3501I
18.00 3601I
18.30 3701I
19.00 3801I
19.30 3901I
20.00 4001I.....................................................................................................
20.30 4101I
21.00 4201I
21.30 4301I
22.00 4401I
22.30 4501I
23.00 461I
23.30 471I
 0.    481I
 0.30 491I
 1.00 501I.....................................................................................................
 1.30 511I
 2.00 521I
 2.30 531I
 3.00 541I
 3.30 551I
 4.00 561I
 4.30 571I
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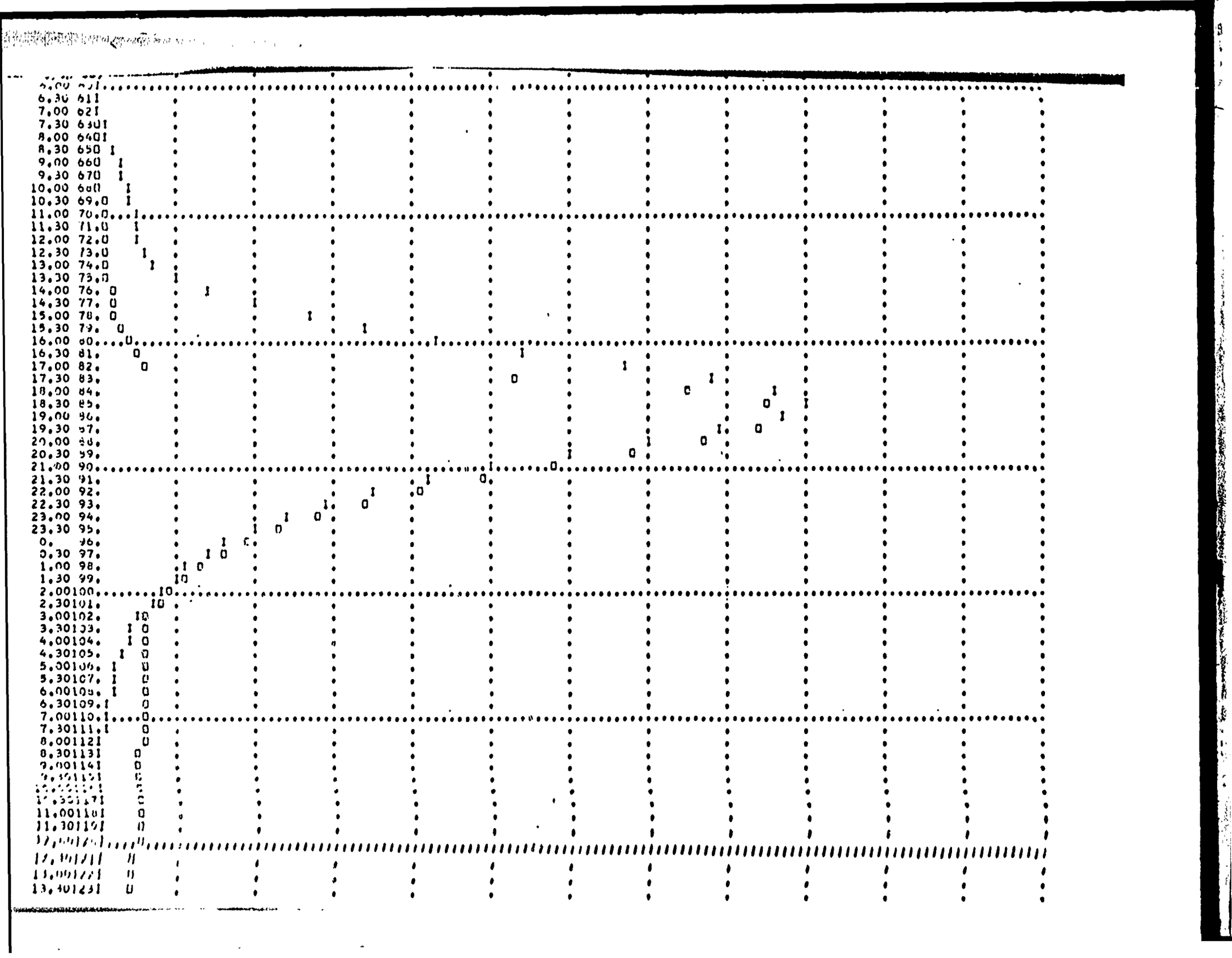

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15.301211    0
16.001221    0
16.301231    0
17.001241...0
17.301251    0
18.001261  0
18.301271  0
19.001281  0
19.301291  0
20.001301  0
20.301311  0
21.001321  0
21.301331  0
22.001341...0
22.301351    0
23.001361  0
23.301371  0
 0.  1381  0
 0.301391  0
 1.001401  0
 1.301411  0
 2.001421  0
 2.301431  0
 3.001441...0
 3.301451  0
 4.001461  0
 4.301471  0
 5.001481  0
 5.301491  0
 6.001501  0
 6.301511  0
 7.001521  0
 7.301531  0
 8.001541...0
 8.301551  0
 9.001561  0
 9.301571  0
10.001581  0
10.301591  0
11.001601  0
11.301611  0
12.001621 0
12.301631 0
13.001641 0...
13.301651 0
14.001661 0
14.301671 0
15.001681 0
15.301691 0
16.001701 0
16.301711 0
17.001721 0
17.301731 0
18.001741 0...
18.301751 0
19.001761 0
19.301771 0
20.001781 0
20.301791 0
21.001801 0
21.301811 0
22.001821 0
22.301831 0
```

STATION 1, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	3.	4.	5.	7.	8.
9.	9.	10.	10.	11.	11.	11.	11.	11.	11.
11.	11.	11.	11.	11.	11.	10.	10.	10.	10.
10.	10.	10.	11.	12.	14.	16.	19.	23.	27.
31.	35.	40.	45.	53.	63.	78.	99.	125.	1063.
1722.	2451.	2954.	3333.	3542.	3524.	3294.	2946.	2961.	2171.
1016.	1600.	1348.	1123.	932.	775.	645.	538.	449.	374.
311.	257.	212.	174.	142.	129.	128.	126.	124.	122.
120.	118.	115.	113.	111.	108.	105.	103.	100.	98.
96.	93.	91.	89.	87.	85.	83.	81.	79.	77.
76.	74.	72.	70.	69.	67.	66.	64.	63.	61.
60.	58.	57.	56.	54.	53.	52.	51.	50.	48.
47.	46.	45.	44.	43.	42.	41.	40.	39.	38.
38.	37.	36.	35.	34.	34.	33.	32.	31.	31.
30.	29.	29.	28.	27.	27.	26.	26.	25.	24.
24.	23.	23.	22.	22.	21.	21.	21.	20.	20.
19.	19.	18.	18.	18.	17.	17.	17.	16.	16.

STORAGE

2.	2.	2.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	5.	6.	7.	9.	11.	13.	15.
17.	18.	19.	20.	21.	21.	21.	21.	21.	21.
21.	21.	21.	21.	20.	20.	20.	20.	19.	19.
19.	19.	19.	20.	22.	26.	30.	35.	41.	48.
55.	62.	70.	80.	92.	110.	136.	171.	216.	259.
277.	291.	299.	306.	309.	309.	305.	259.	293.	287.
281.	273.	264.	257.	250.	244.	240.	237.	234.	231.
229.	227.	225.	224.	223.	222.	220.	218.	215.	211.
208.	203.	199.	195.	190.	186.	182.	178.	174.	170.
166.	162.	158.	154.	151.	147.	144.	141.	138.	134.
131.	128.	125.	122.	120.	117.	114.	112.	109.	107.
104.	102.	100.	97.	95.	93.	91.	89.	87.	85.
83.	81.	79.	78.	76.	74.	73.	71.	69.	68.
66.	65.	64.	62.	61.	60.	58.	57.	56.	55.
53.	52.	51.	50.	49.	48.	47.	46.	45.	44.
43.	42.	41.	40.	40.	39.	38.	37.	37.	36.
35.	34.	34.	33.	32.	32.	31.	30.	30.	29.

STAGE

1306.3	1306.3	1306.3	1306.3	1306.4	1306.4	1306.4	1306.4	1306.4	1306.4
1306.4	1306.4	1306.4	1306.4	1306.5	1306.5	1306.5	1306.5	1306.5	1306.6
1306.5	1306.5	1306.5	1306.5	1306.5	1306.5	1306.5	1306.6	1306.6	1306.6
1306.6	1306.6	1306.6	1306.7	1306.9	1307.1	1307.4	1307.7	1308.0	1308.3
1308.5	1308.7	1308.9	1309.0	1309.1	1309.1	1309.2	1309.2	1309.2	1309.2
1309.2	1309.1	1309.1	1309.1	1309.0	1309.0	1309.0	1308.9	1308.9	1308.8
1308.8	1308.8	1308.9	1309.0	1309.3	1309.8	1310.5	1311.3	1312.2	1313.2
1314.3	1315.4	1316.5	1318.0	1319.8	1322.6	1326.4	1331.7	1338.5	1341.5
1342.9	1343.6	1344.0	1344.3	1344.5	1344.5	1344.3	1344.0	1343.7	1343.4
1343.1	1342.6	1342.1	1341.6	1341.2	1340.9	1340.6	1340.4	1340.2	1340.0
1339.9	1339.8	1339.7	1339.6	1339.5	1339.4	1339.1	1338.8	1338.5	1337.8

1325.7	1325.3	1324.9	1324.4	1324.0	1323.6	1319.7	1319.4	1319.1	1318.8
1321.7	1321.3	1321.0	1320.6	1320.3	1320.0	1316.9	1316.7	1316.4	1316.2
1318.5	1318.2	1317.9	1317.7	1317.4	1317.2	1314.7	1314.6	1314.4	1314.2
1316.0	1315.8	1315.5	1315.3	1315.1	1314.9	1313.0	1312.9	1312.7	1312.6
1314.0	1313.8	1313.7	1313.5	1313.3	1313.2	1311.7	1311.6	1311.5	1311.4
1312.5	1312.3	1312.2	1312.1	1311.9	1311.8	1310.7	1310.6	1310.5	1310.4
1311.2	1311.1	1311.0	1310.9	1310.8	1310.7				

PEAK OUTFLOW IS 3542. AT TIME 42.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3542.	2644.	889.	321.	46463.
CMS	100.	75.	25.	9.	1316.
INCHES		11.77	15.82	17.15	17.23
MM		298.89	401.82	435.70	437.73
AC-FT		1311.	1762.	1911.	1920.
THOLS CU M		1617.	2174.	2357.	2368.

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 0.50	 RATIO 2 1.00
HYDROGRAPH AT	1	2.09 (0.00)	1	1792. (50.74)(	3584. 101.43)(
ROUTED TO	1	2.09 (0.00)	1	1746. (49.45)(	3542. 100.29)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1306.30	1306.30	1348.90
STORAGE	2.	2.	398.
OUTFLOW	0.	0.	9009.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.50	1342.91	0.	278.	1746.	0.	43.00	0.
1.00	1344.48	0.	309.	3542.	0.	42.50	0.

APPENDIX D

STABILITY COMPUTATIONS

New York — MILL BROOK - SITE 1

Dew 5-12. 5-13-77 NY-2682-D

SLOPE STABILITY - Homogeneous fill

4-3

Borrow materials will consist of GM, SM & GM-GC from the emergency spillway excavation.

typically the materials are represented by samples by field samples 3.1, 203.1 & 206.1

These mat'ls contain:

42 - 45% Fines — LL = 18-25, PI = 1-9

24 - 41% Sands

25 - 35% Gravel

density - ASTM D-698, method A

γ_d = 119.5 - 121.0 pcf @ opt moisture = 11.5%

Shear strength -

@ 95% of γ_d

a. total stress : ϕ = 12° - 13.5°, C = 325 psf

b. effective stress : ϕ = 30° - 30.5°, C = 125 psf

CONDITION	Select embankment properties for slope stability					
	REQ'D F.S.	γ_m	γ_{SAT}	γ_{comp}	ϕ	C
1. Steady Seepage	1.5	133.2	137.1	74.7	ϕ' = 30°, 13°	C' = 125, 325
w/Seismic	1.1	133.2	137.1	74.7	ϕ = 13°	C = 325
* 2. Drawdown w/seismic	1.3	133.2	137.1	74.7	ϕ = 13°	C = 325
3. End of Const	1.4	133.2	137.1	74.7	ϕ' = 30°	C' = 125

The Structure is located Chenango County, N.Y. which is seismic zone I, therefore a seismic coefficient of 0.05 will be used.

(1334.7)

Drawdown will be assumed to take place from the 1% exit elev.

New York — Mill Brook - Site 1

DEW 5.12 DPW 5-13-77 NY-2682-D

Slope Stability

4-4

@ 95% of Std. $\gamma_d = 119.5\%$

$95\% \gamma_d = 113.5$ pcf

let w be ±2% or 9.5% to 13.5% ✓

$\gamma_d = \frac{\gamma_m}{1+w}$

$\gamma_m = \gamma_d(1+w) = 119.5(1.115) = 133.2$ pcf

for $\gamma_{sat} = W_s + W_{wat} = 119.5 + \gamma_{H_2O}$

and $V_s = \frac{W_s}{\gamma_w G_s} = \frac{119.5}{2.67(62.4)} = 0.717\ ft^3$

@ 100% sat. $V_w = 0.283$

and $W_{wat} = 0.283(62.4) = 17.6$ pcf

$\therefore \gamma_{sat} = 119.5 + 17.6 = 137.1$ pcf

$\gamma_{bouyant} = 137.1 - 62.4 = 74.7$

Foundation soils

1. Soils are much the same as abutments where BORROW will be taken, densities are good. Therefor use the same soil properties as for the embankment. Surface organic soils will be removed

outwash rather than till

ESTIMATED FOR ML-CL IN FOUNDATION $\phi = 10°$ (TOTAL) $C = 400$ γ_{SAT} 130
$\phi = 25$ $C = 150$ (EFF) $\gamma_{bouy} = 67.6$

2. Rock - Shale and Sandstone. For Slope Stability use a $\phi = 50°$, $\gamma_{SAT} = 160$ pcf and $C = 2,000$ psf

BASED ON FLOW COUNT DATA & PRECONSOLIDATED STATE OF MATERIAL USE $\phi = 12°$ (total) $C = 600$ (7/11/77 DPW)

NEW YORK MILL BROOK - SITE 1
WALKER 6-29-77 NY-2682-D
SLOPE STABILITY - UPSTREAM FACE - SUMMARY

4-7

UPSTREAM FACE.

DRAWDOWN FROM PERM POOL (ELEV 1307)

USING TOTAL STRESS PARAMETERS (CU).

MIN FS = 1.45 > REQ'D 1.3

∴ UPSTREAM FACE OK

NOTE:

FOR U.S. FACE WITH DRAWDOWN FROM 100 WATER SURFACE ELEV (1334.7)

USING TOTAL STRESS (CU) PARAMETERS

FS = 1.16 WITH FAILURE SURFACE ENTIRELY WITHIN EMBANKMENT IN WHICH CASE AFS OF 1.2 IS ALLOW.

∴ FS 1.16 ≈ 1.2

THIS EMBANKMENT IS CONSIDERED STABLE BECAUSE OF LOW FREQUENCY OF OCCUERANCE OF HIGH WATER CONDITION

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

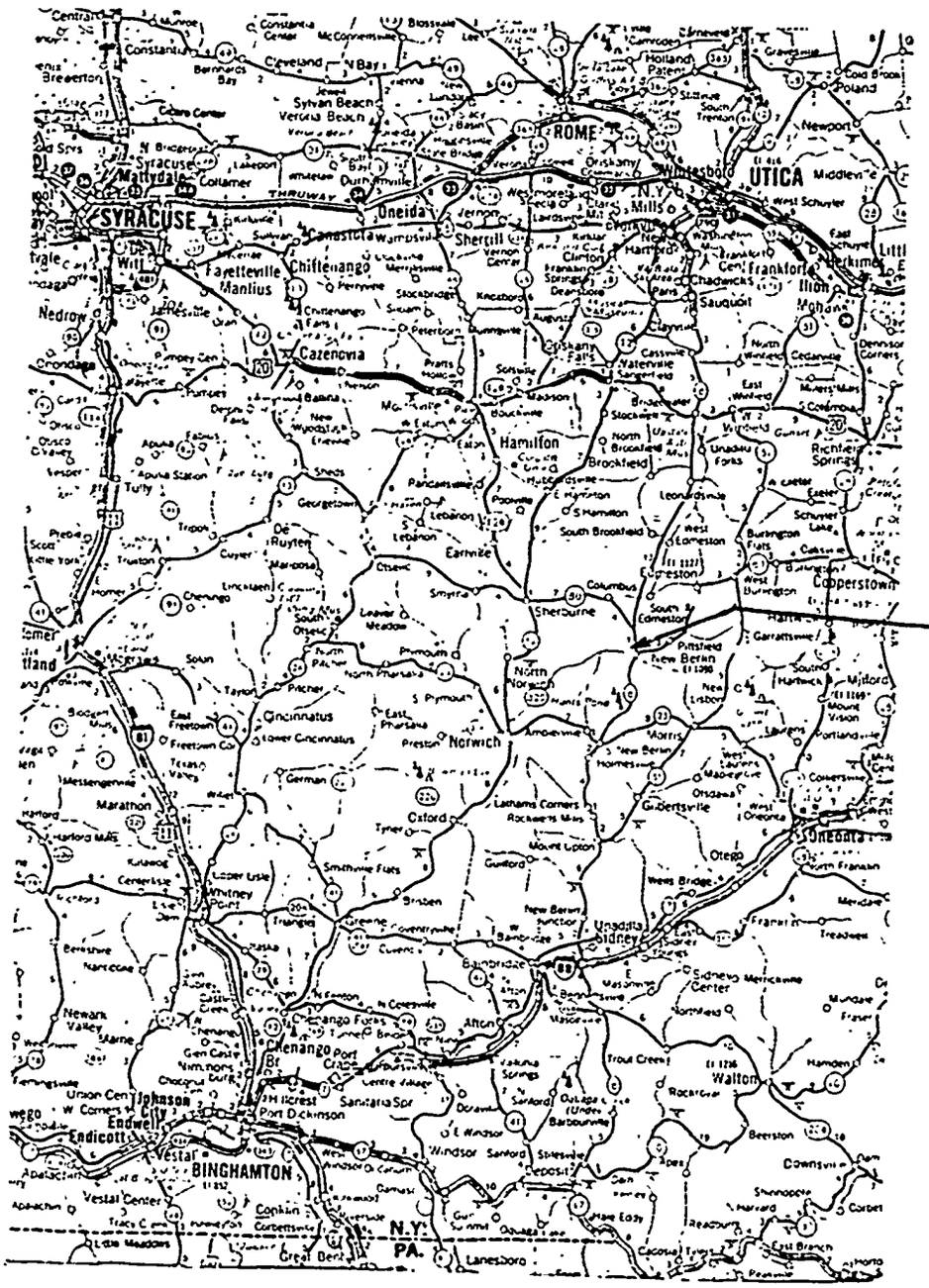
3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960

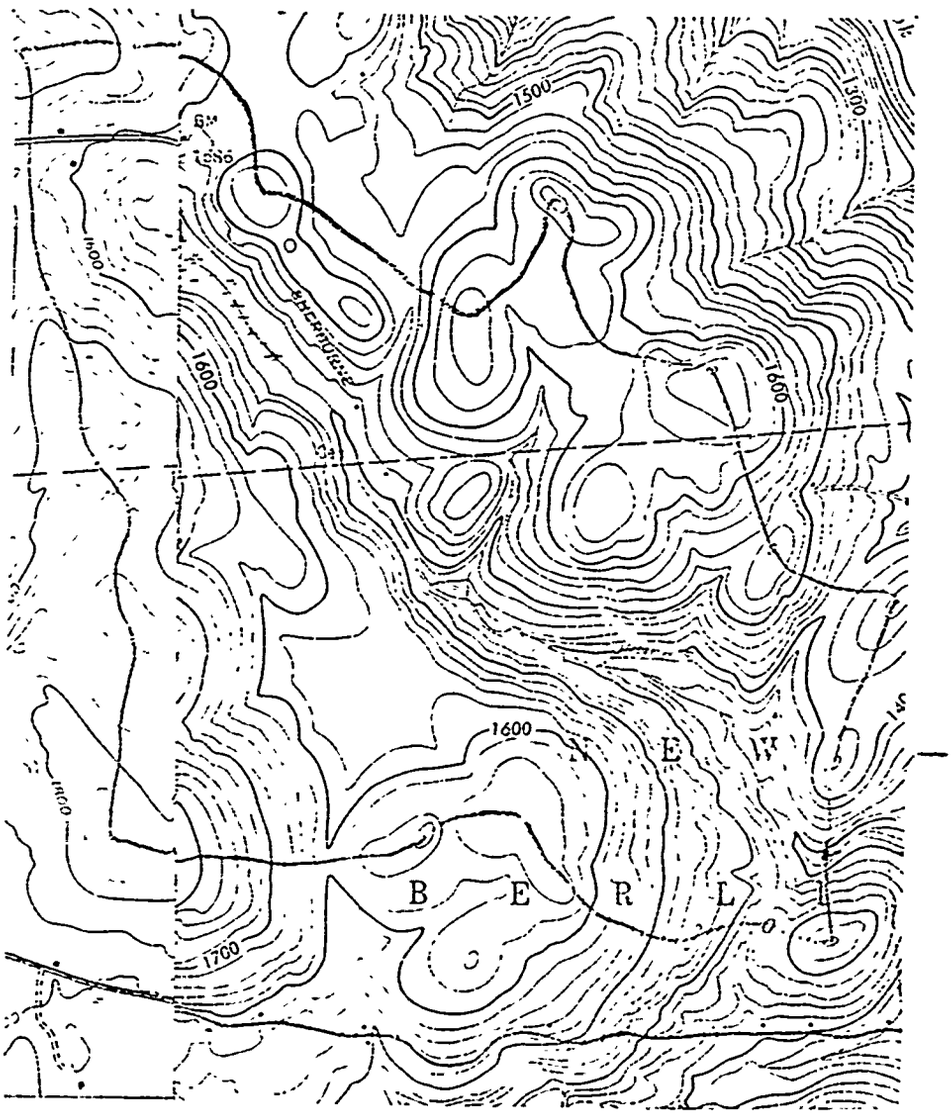
5) U.S. Department of the Interior, Bureau of Reclamation; Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX F

DRAWINGS



VICINITY MAP
MILL BROOK WATERSHED PROJECT
SITE I
NY-715



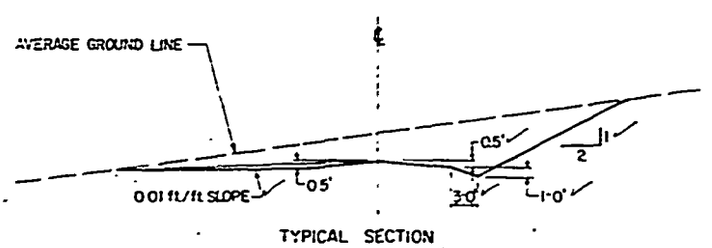
TOPOGRAPHIC MAP
MILLBROOK WATERSHED PROJECT
SITE 1
NY 715

CONSTRUCTION DETAILS

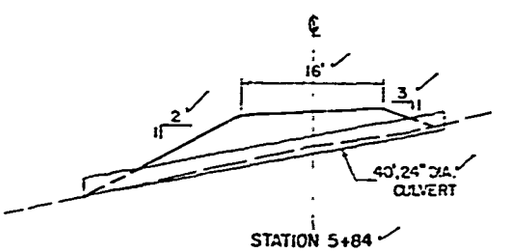
LEGEND

- TEST PIT, LOGGED ONLY
- TEST PIT, LOGGED & SAMPLED
- DRILL HOLE, LOGGED ONLY
- DRILL HOLE, LOGGED & SAMPLED
- SEDIMENT POOL ELEV.
- DESIGN HIGH WATER ELEV.
- FENCE LINE (EXISTING, TO BE REMOVED)
- FENCE LINE (TO BE CONSTRUCTED)
- TRANSIT HUB
- CONSTRUCTION LIMIT
- FOUNDATION EXCAVATION AVERAGE DEPTH - 3FT.

1. WOODED AND BRUSH AREAS UNDER THE DAM AND LEVEE (INCLUDING 15 FEET OUTSIDE THE UPSTREAM AND DOWNSTREAM TOES) SHALL BE CLEARED AND GRUBBED
2. WOODED AND BRUSH AREAS UNDER THE EMERGENCY SPILLWAY, INCLUDING 15 FEET OUTSIDE THE CUT SLOPE, SHALL BE CLEARED AND GRUBBED
3. LIMITS TO BE CLEARED AND GRUBBED WILL BE STAKED IN THE FIELD BY THE ENGINEER
4. AREA UPSTREAM FROM THE DAM AND BELOW ELEVATION 1308 SHALL BE CLEARED
5. AREA 100 FEET WIDE LEADING TO THE EMERGENCY SPILLWAY FROM THE SEDIMENT POOL SHALL BE CLEARED
6. WASTE AREA, ACCESS ROAD, AND PRINCIPAL SPILLWAY OUTLET SHALL BE CLEARED
7. LIMITS TO BE CLEARED WILL BE STAKED IN THE FIELD BY THE ENGINEER
8. DEPTHS AND LIMITS OF BORROW EXCAVATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER
9. AT COMPLETION OF EARTH FILL OPERATIONS, THE BORROW AND WASTE AREAS SHALL BE LEFT GENTLY SLOPING, GENERALLY SMOOTH AND FREE-DRAINING
10. BOTTOM SECTION OF THE EMERGENCY SPILLWAY SHALL BE COVERED WITH 6 INCHES OF TOPSOIL THROUGH ENTIRE LENGTH

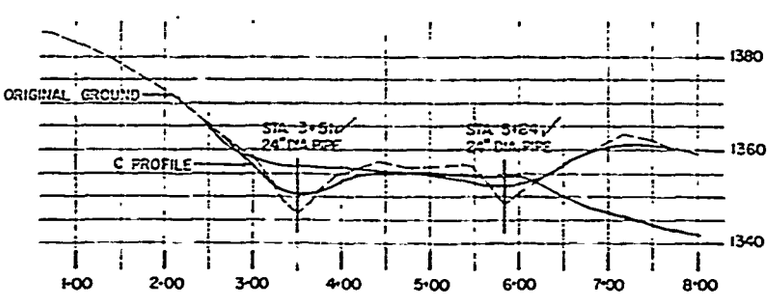


TYPICAL SECTION
STATION 4+00



STATION 5+84

ACCESS ROAD SECTIONS

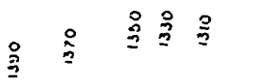


ACCESS ROAD PROFILE

QUANTITIES

PER MODIFICATION NO. 5

EXCAVATION	
EMBANKMENT	1500 CY
24" DIA. CULVERT PIPE	84 LF



LIMIT OF FOUNDATION EXCAVATION. (SEE NEXT SHEET)

CONSTRUCTION LIMIT LINE

MON. NO. 5

DESIGN HIGH WATER ELEV. 1343.1

SEDIMENT ELEV. 130

SHENBURNE

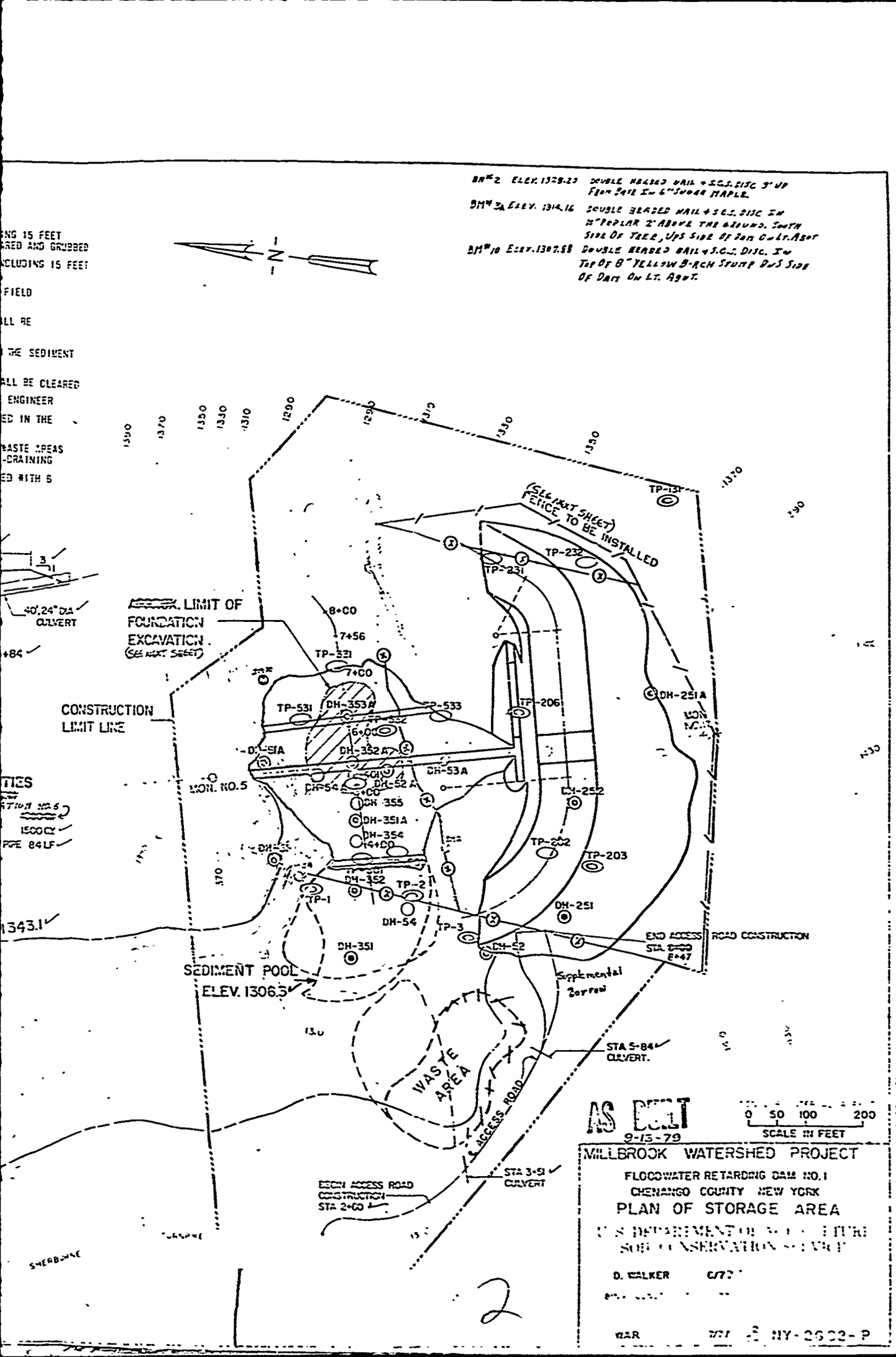
1

BM#2 ELEV. 1328.23 DOUBLE HEADED NAIL & S.C.S. DISC 3' UP FROM BASE IN 6" SUGAR MAPLE.

BM#3A ELEV. 1314.16 DOUBLE HEADED NAIL & S.C.S. DISC IN 14" POPLAR 2' ABOVE THE GROUND. SOUTH SIDE OF TREE, UPS SIDE OF DAM ON LT. ABUT.

BM#10 ELEV. 1307.88 DOUBLE HEADED NAIL & S.C.S. DISC. IN TOP OF 8" YELLOW BIRCH STUMP DWS SIDE OF DAM ON LT. ABUT.

NG 15 FEET
RED AND GRUBBED
CLUDING 15 FEET
FIELD
LL BE
THE SEDIMENT
ILL BE CLEARED
ENGINEER
ED IN THE
WASTE AREAS
-DRAINING
ED WITH S



AS BUILT 9-13-79

0 50 100 200
SCALE IN FEET

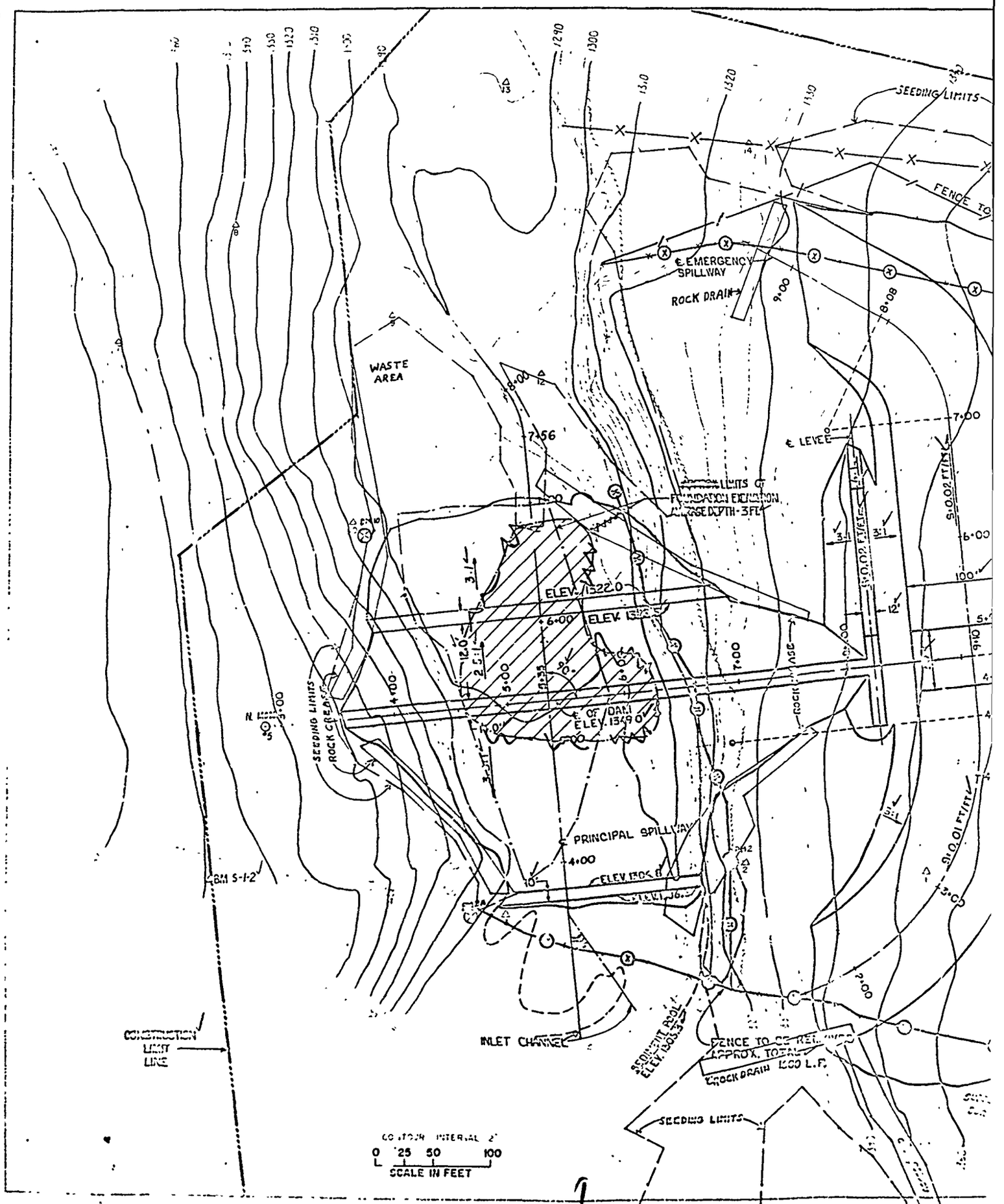
MILLBROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 1
CHENANGO COUNTY NEW YORK
PLAN OF STORAGE AREA

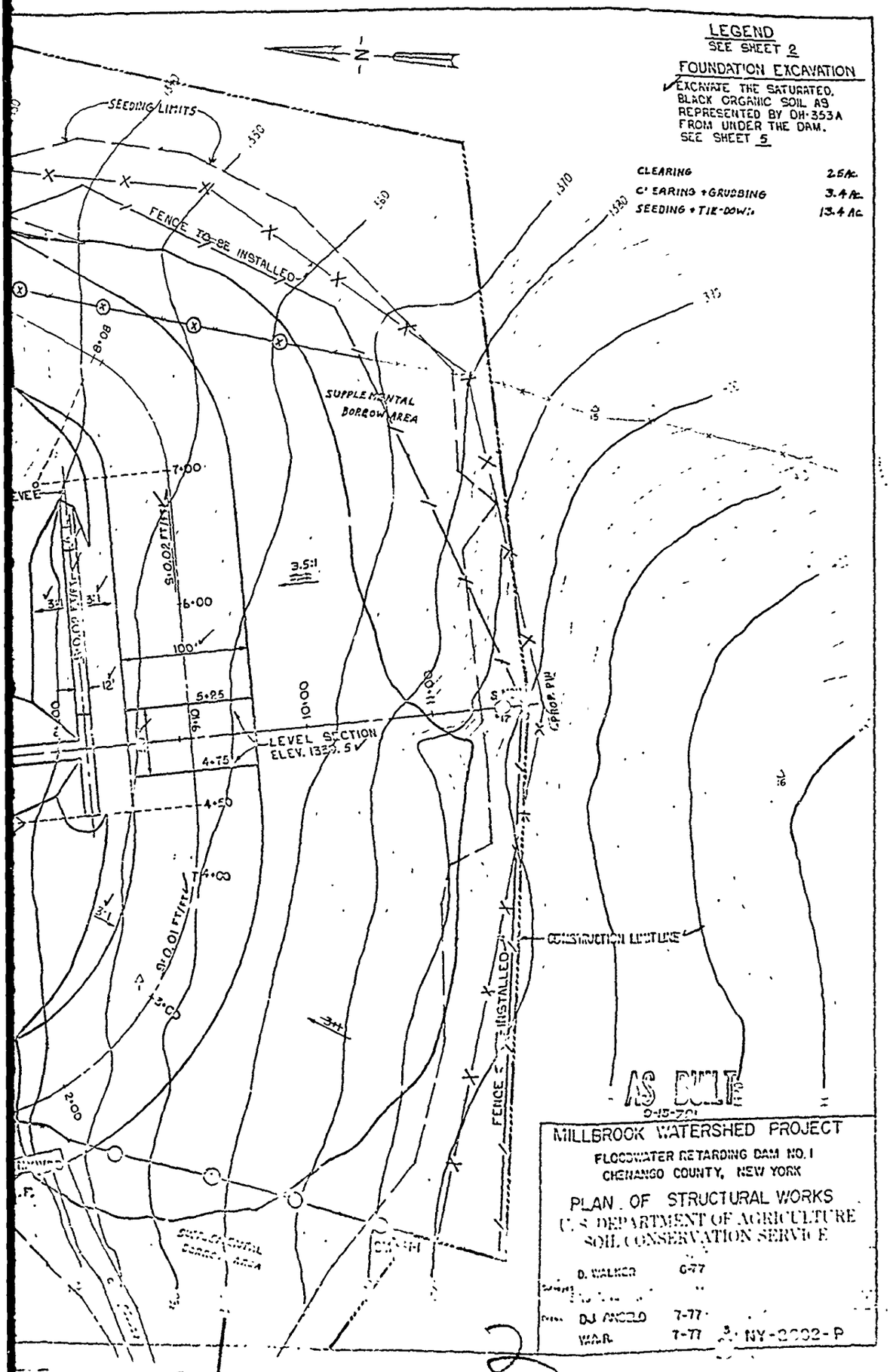
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

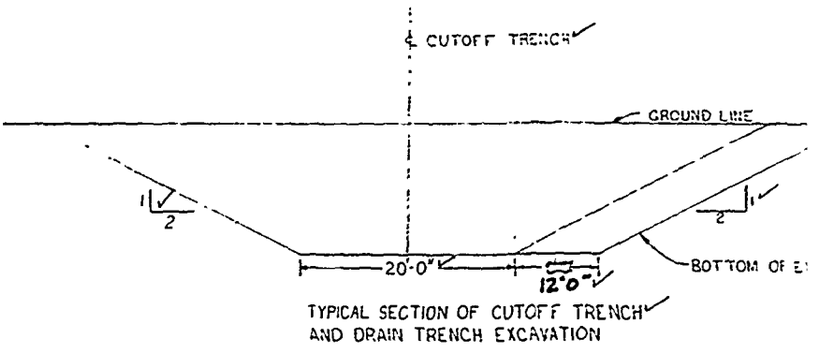
D. WALKER 6/77

WAR NY-2603-P

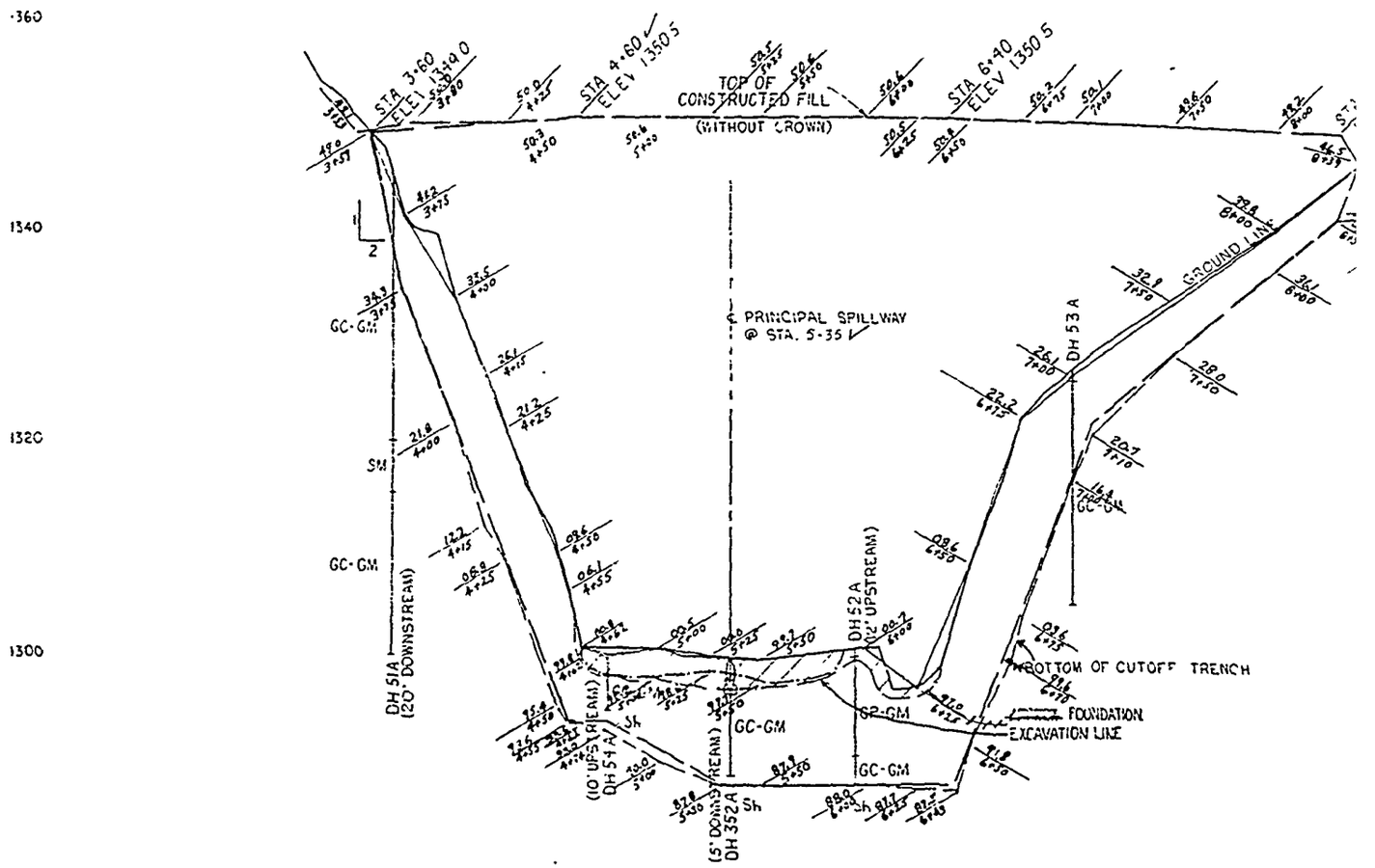
1 2


SEEDING LIMITS
FENCE TO
℄ EMERGENCY SPILLWAY
ROCK DRAIN
WASTE AREA
℄ LEVEE
LIMITS OF FOUNDATION EXCAVATION AVERAGE DEPTH - 3 FT.
ELEV. 1322.0
ELEV. 1
℄ OF DAM ELEV. 1349.0
SEEDING LIMITS
ROCK GREASE
PRINCIPAL SPILLWAY
ELEV. ROCK
BM S-1-2
CONSTRUCTION LIMIT LINE
INLET CHANNEL
SEDIMENT POOL ELEV. 1305.5
FENCE TO BE REMOVED APPROX. TOTAL
ROCK DRAIN 1500 L.F.
SEEDING LIMITS
CONTOUR INTERVAL 2'
0 25 50 100
SCALE IN FEET


LEGEND
SEE SHEET 2
FOUNDATION EXCAVATION
EXCAVATE THE SATURATED, BLACK ORGANIC SOIL AS REPRESENTED BY DH-353A FROM UNDER THE DAM. SEE SHEET 5
CLEARING 2.5Ac.
CLEARING + GRUBBING 3.4 Ac.
SEEDING + TIE-DOWN 13.4 Ac.
SEEDING LIMITS
FENCE TO BE INSTALLED
SUPPLEMENTAL BORROW AREA
LEVEE
LEVEL SECTION ELEV. 1339.5
CONSTRUCTION LIMITS
FENCE TO BE INSTALLED
AS BUILT
9-15-78
MILLBROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 1
CHENANGO COUNTY, NEW YORK
PLAN OF STRUCTURAL WORKS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D. WALKER 6-77
DJ ANGLO 7-77
WAR 7-77
NY-0002-P



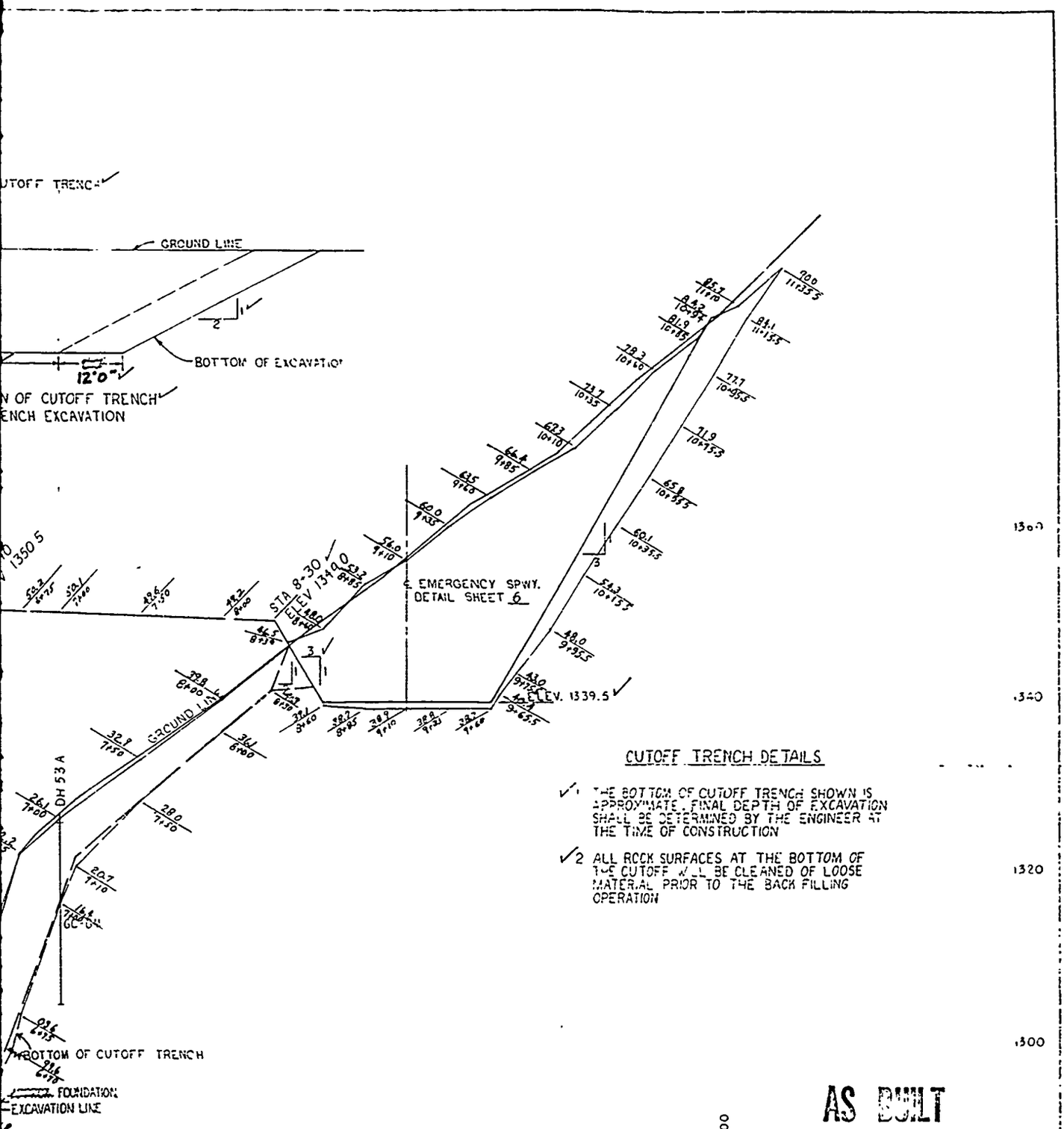
TYPICAL SECTION OF CUTOFF TRENCH AND DRAIN TRENCH EXCAVATION



PROFILE ALONG ℄ OF CUTOFF TRENCH

1

3+00 4+00 5+00 6+00 7+00 8+00



CUTOFF TRENCH DETAILS

1. THE BOTTOM OF CUTOFF TRENCH SHOWN IS APPROXIMATE. FINAL DEPTH OF EXCAVATION SHALL BE DETERMINED BY THE ENGINEER AT THE TIME OF CONSTRUCTION
2. ALL ROCK SURFACES AT THE BOTTOM OF THE CUTOFF WILL BE CLEANED OF LOOSE MATERIAL PRIOR TO THE BACK FILLING OPERATION

AS BUILT

9/13/79

MILLBROOK WATERSHED PROJECT

FLOODWATER RETARDING DAM NO 1

CHENANGO COUNTY NEW YORK

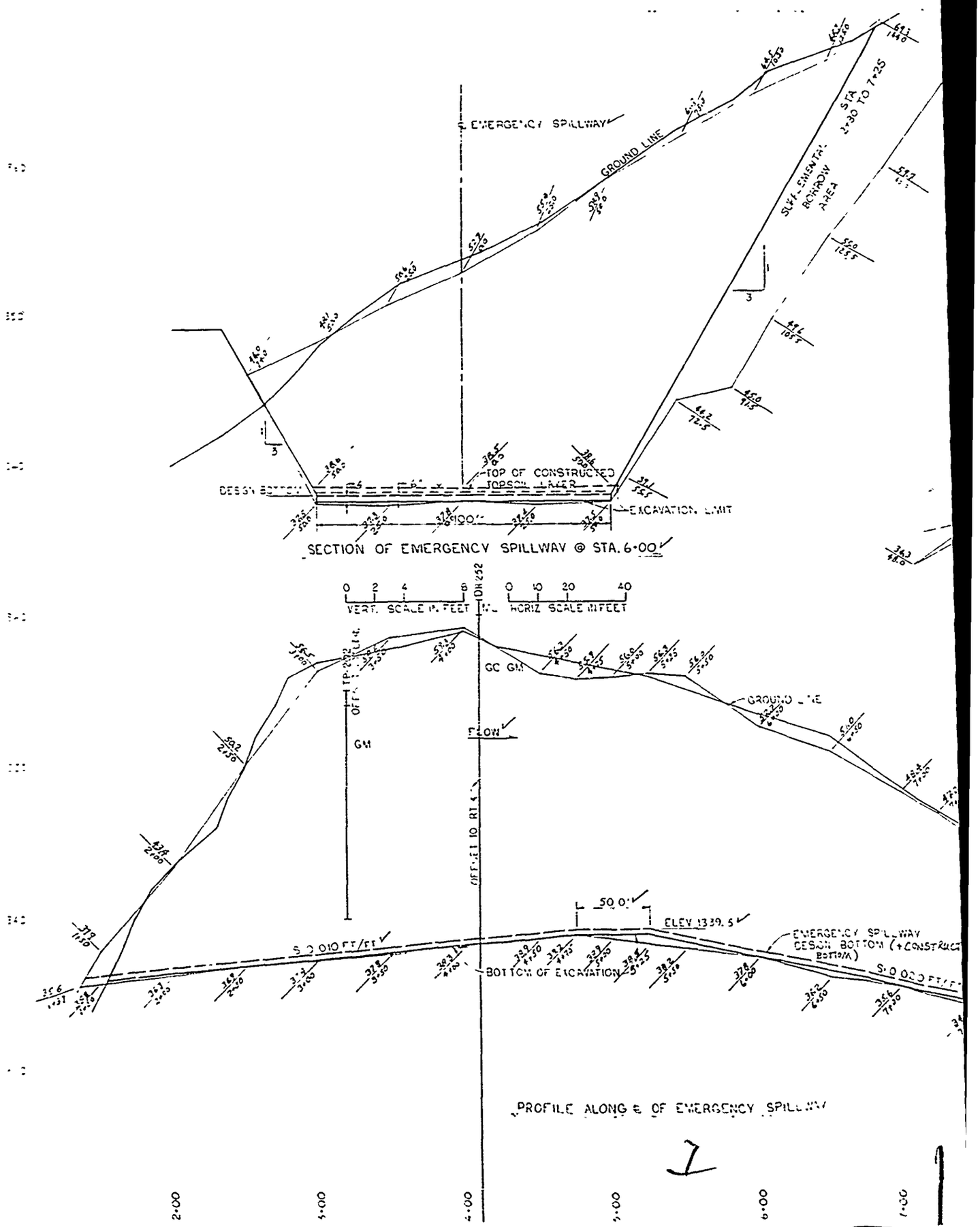
CUTOFF TRENCH EXCAVATION

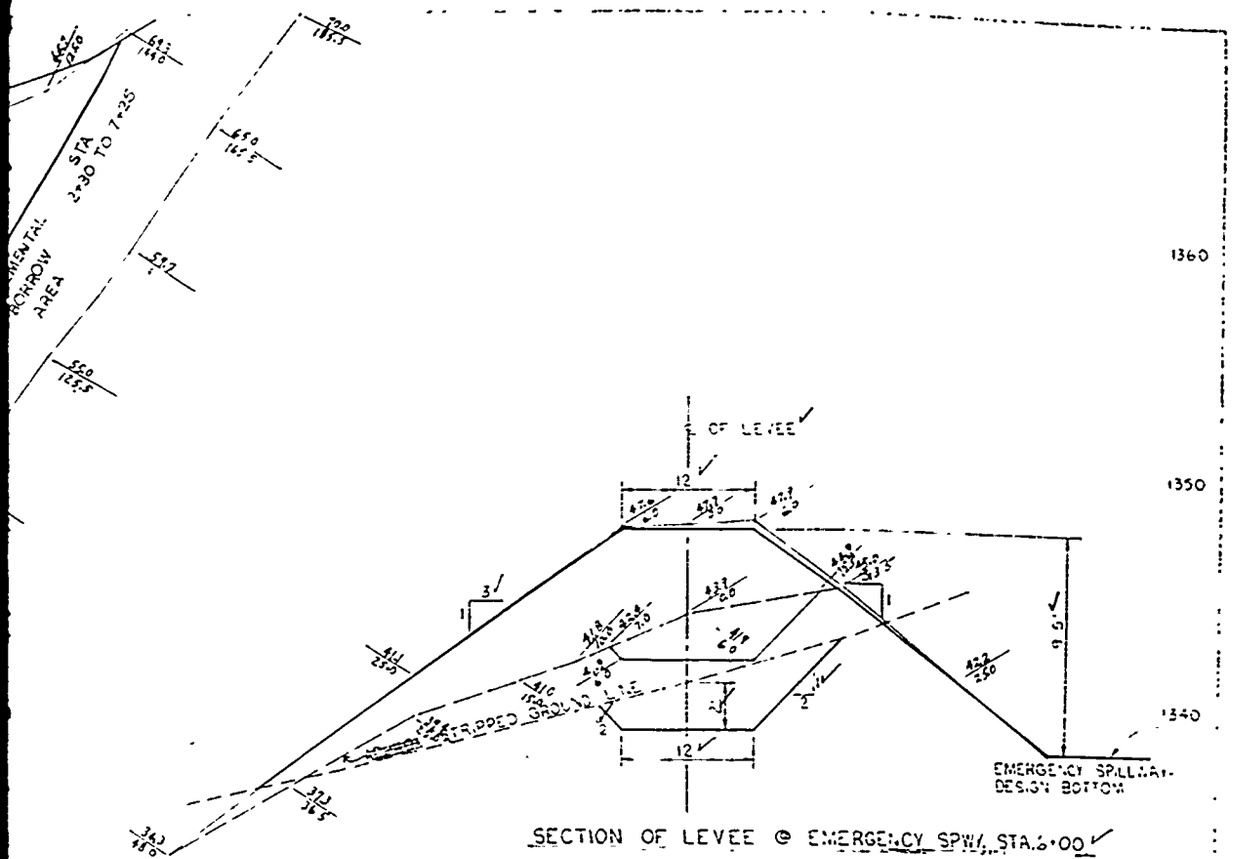
D WALKER 4-77

D ANGELO 7-77

WAR 7-77

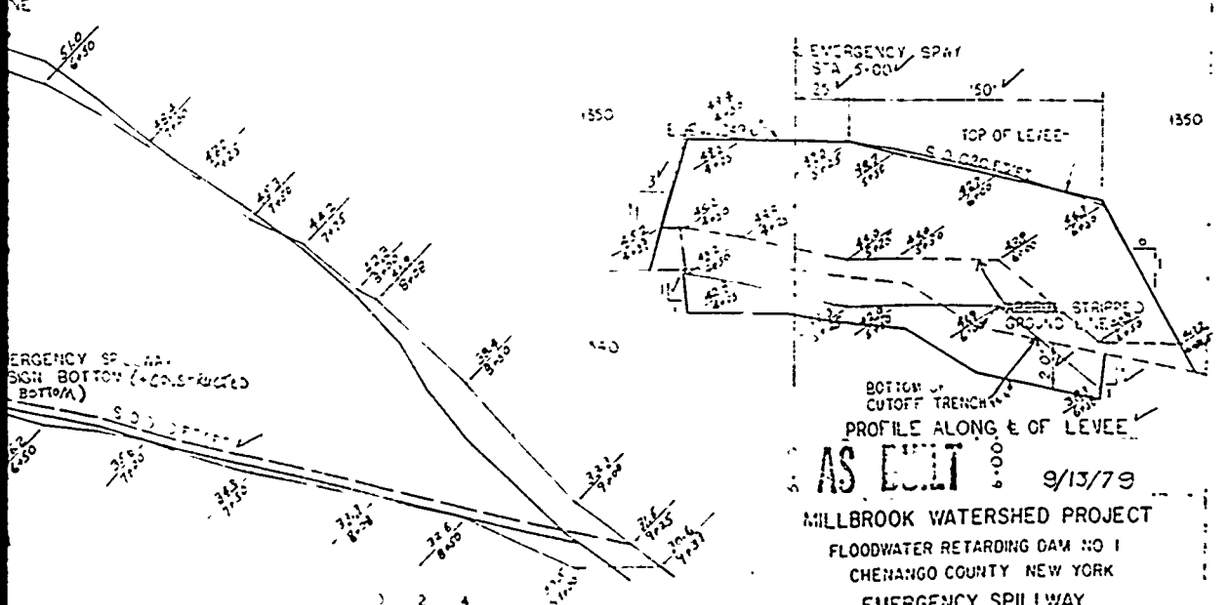
NY-2682-P


EMERGENCY SPILLWAY
GROUND LINE
SLIGHTLY ENLARGED BORROW AREA STA 1+30 TO 7+25
DESIGN BOTTOM
TOP OF CONSTRUCTED TOPSOIL LAYER
EXCAVATION LIMIT
100'
SECTION OF EMERGENCY SPILLWAY @ STA. 6+00
VERT. SCALE IN FEET
HORIZ SCALE IN FEET
GC GM
GROUND LINE
GM
FLOW
OFFSET TO RT
50.0'
ELEV 1339.5
S 0.010 FT/FT
BOTTOM OF EXCAVATION
EMERGENCY SPILLWAY DESIGN BOTTOM (+CONSTRUCT BOTTOM)
S 0.020 FT/FT
PROFILE ALONG ℄ OF EMERGENCY SPILLWAY
2+00
3+00
4+00
5+00
6+00
7+00



SECTION OF LEVEE @ EMERGENCY SPWY. STA. 6+00

VERT SCALE IN FEET HOR. SCALE IN FEET



PROFILE ALONG ℄ OF LEVEE

AS BUILT 9/13/79

MILLBROOK WATERSHED PROJECT

FLOODWATER RETARDING DAM NO 1

CHENANGO COUNTY NEW YORK

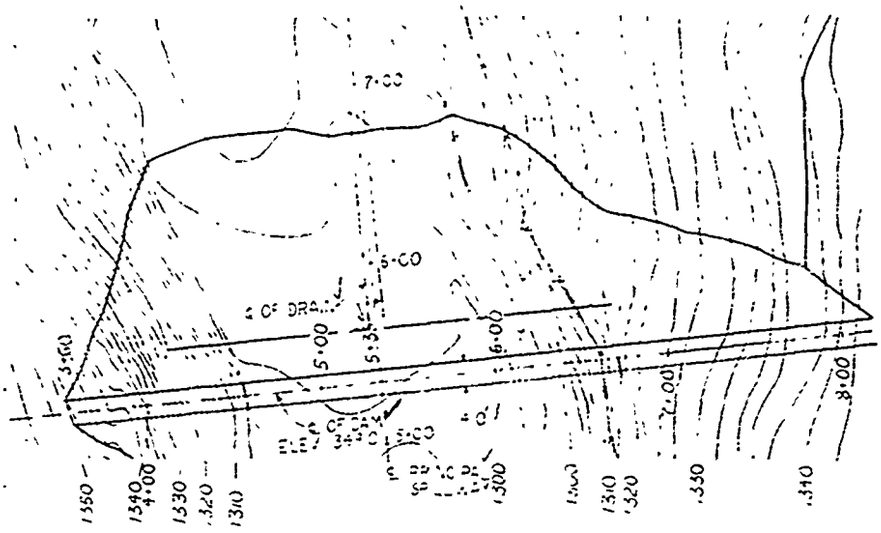
EMERGENCY SPILLWAY

WALKER 4-77

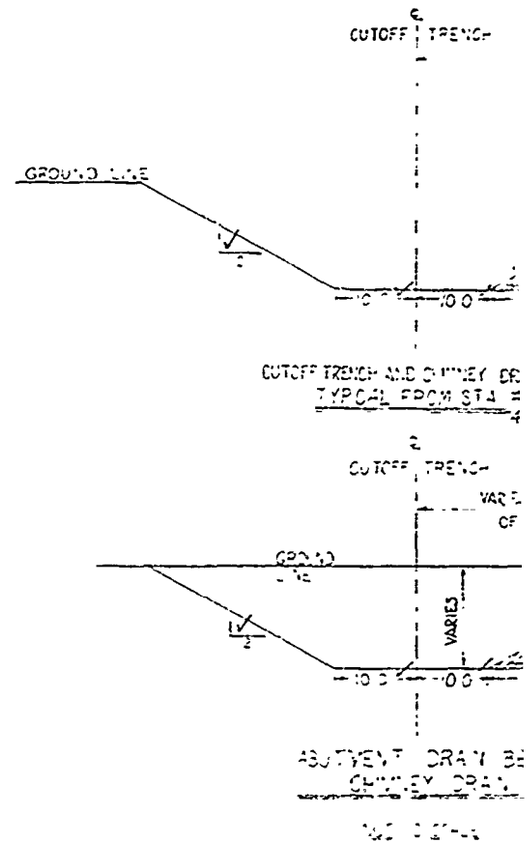
DELO 4-77

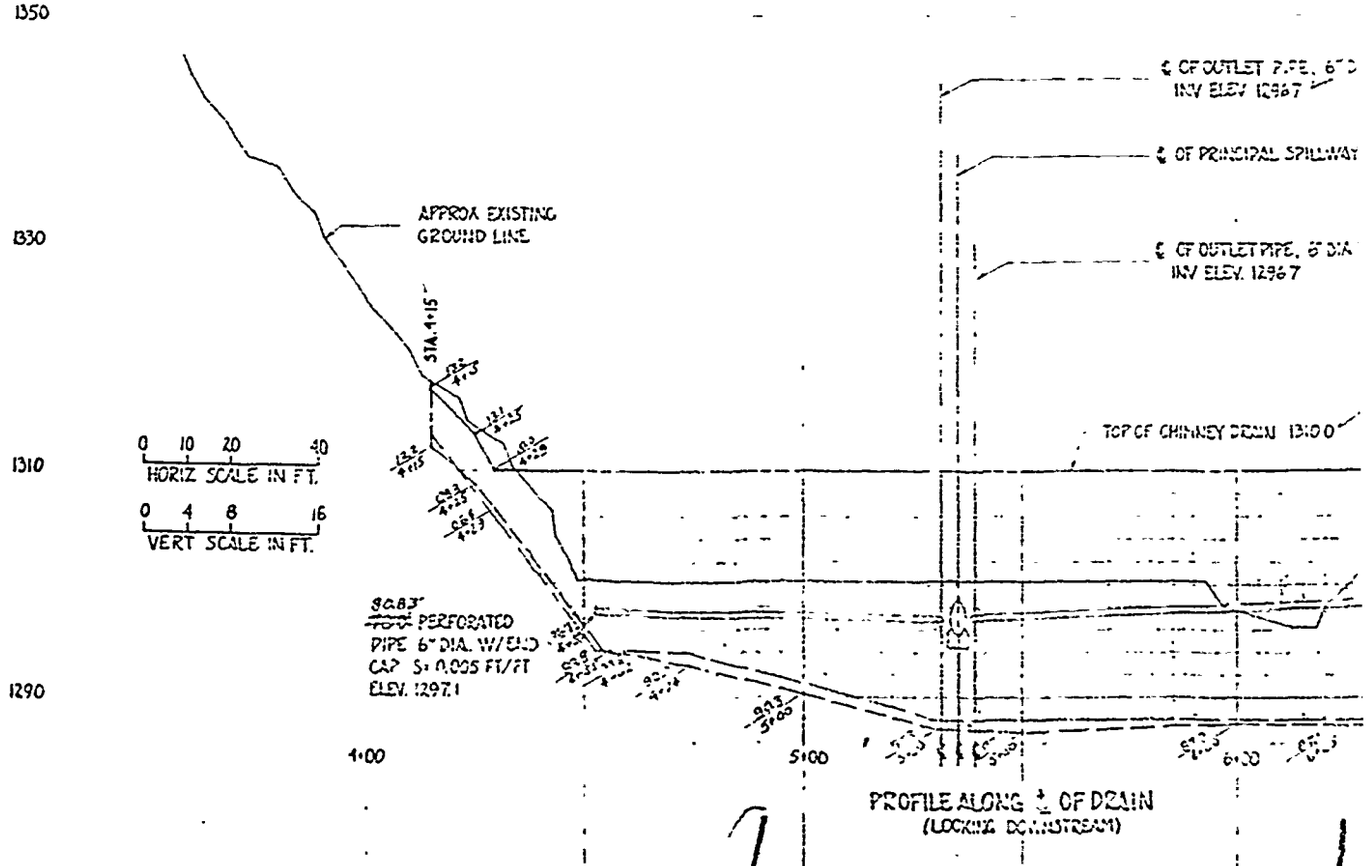
NY-[illegible]-D

DAM
PLAN VIEW

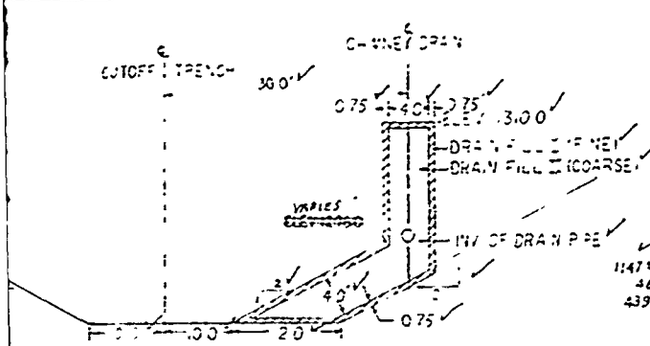


0 25 50 100
SCALE

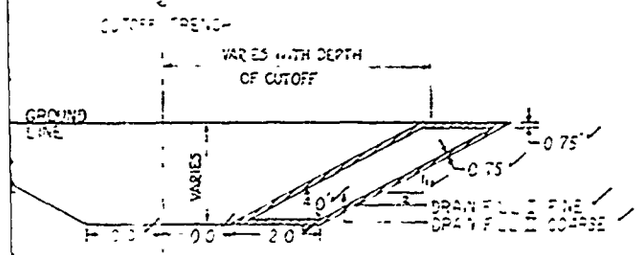




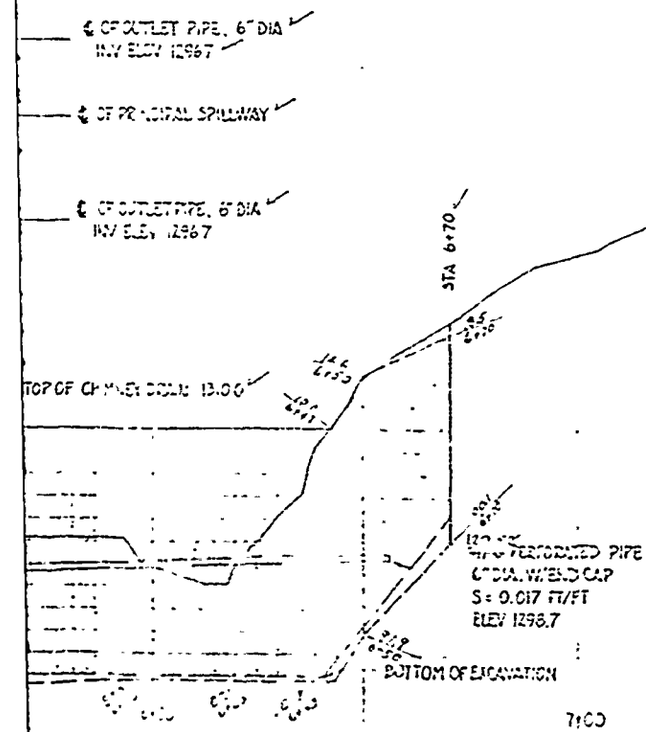
PROFILE ALONG ℄ OF DRAIN
(LOOKING DOWNSTREAM)



CUTOFF TRENCH AND CHIMNEY DRAIN
TYPICAL FROM STA ~~4+00~~ TO STA ~~6+50~~
4+50 6+43



ABUTMENT DRAIN BEYOND CHIMNEY DRAIN



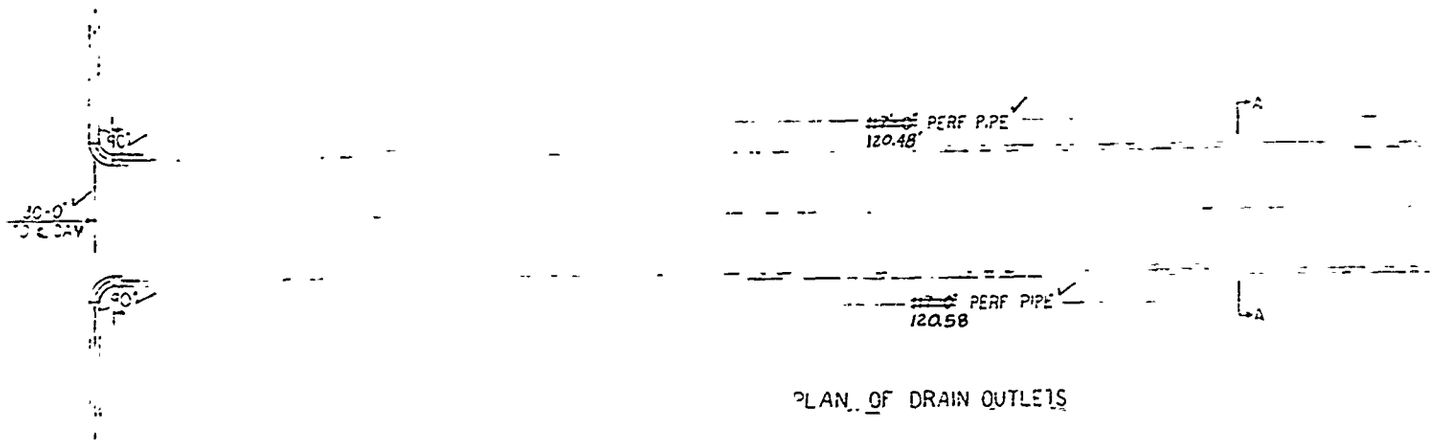
AS BUILT 8-00 9/13/79

MILLBROCK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
CHENANGO COUNTY, NEW YORK
DRAINAGE SYSTEM

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

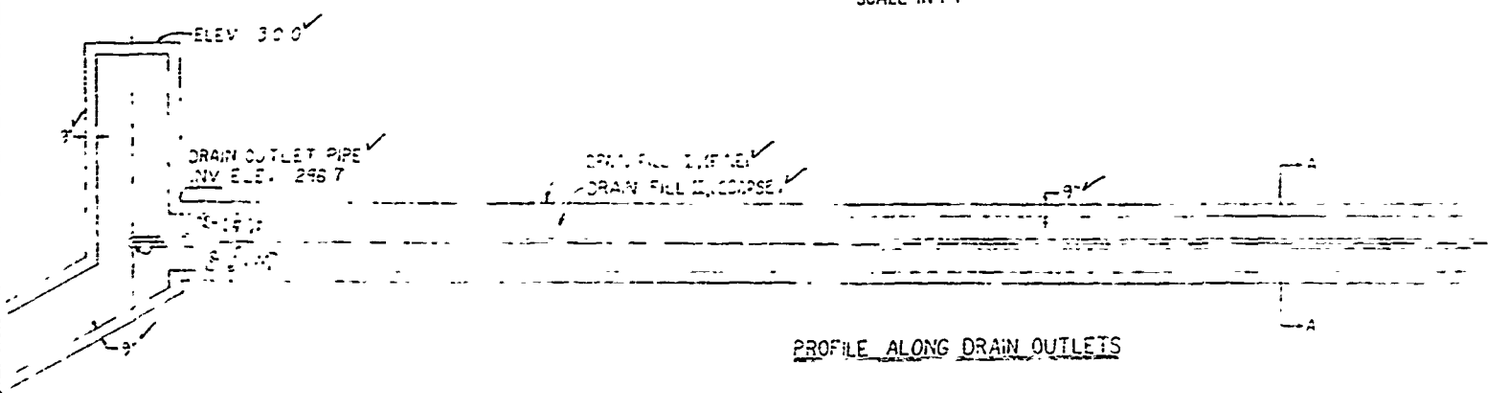
WALKER 6-77
DES CONST UNIT 6-77
CDH 6-77

NY-2082-P

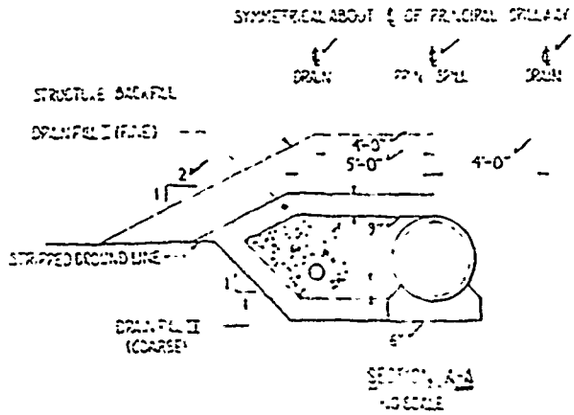


PLAN OF DRAIN OUTLETS

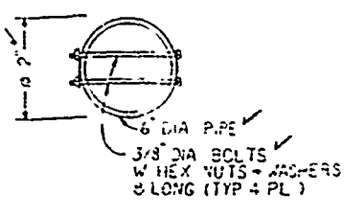
0 2 4 8
SCALE IN FT



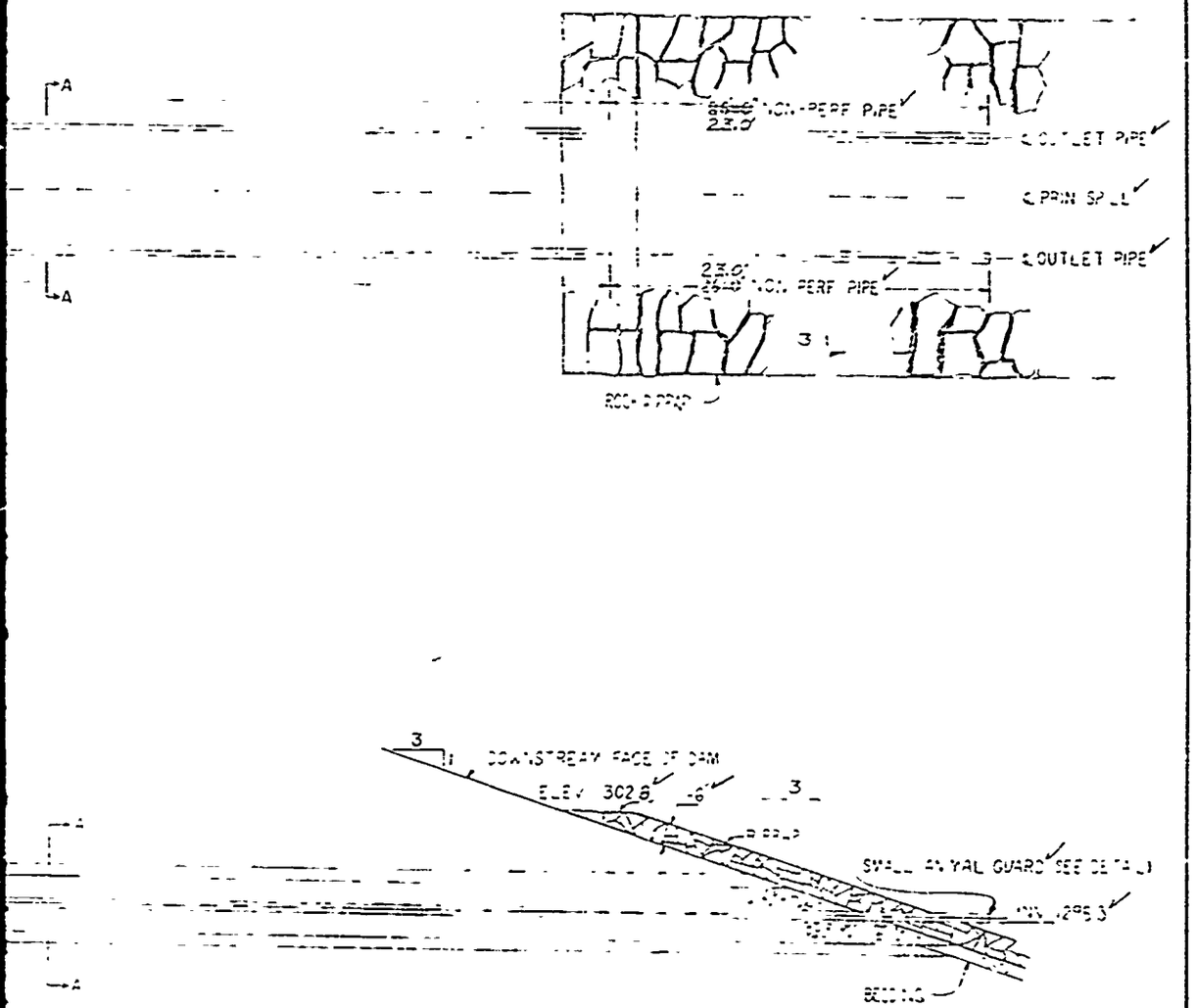
PROFILE ALONG DRAIN OUTLETS



SECTION A-A



SMALL ANIMAL [illegible]



AS BUILT

9/13/78

MILLBROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
CHENANGO COUNTY, NEW YORK
DRAINAGE SYSTEM

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D WALKER
COM
WAH

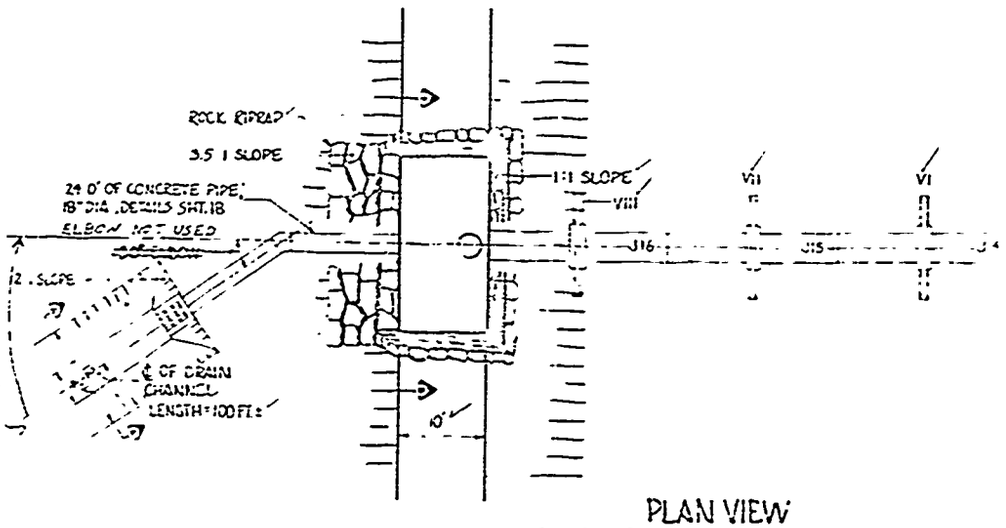
NY-2032-P

JOINT GRID	JOINT	DISTANCE FROM OUTLET	INVERT OF 30" DIAMETER PIPE	GRADE SET
	OUTLET	0	1294.77	1294.77
	J1	20	1294.94	1294.97
	J2	40	1295.13	1295.12
	J3	60	1295.32	1295.33
	J4	80	1295.51	1295.52
	J5	100	1295.71	1295.73
	J6	120	1295.90	1295.90
	J7	140	1296.09	1296.09
	J8	160	1296.28	1296.33
	J9	180	1296.47	1296.52
	J10	200	1296.66	1296.67
	J11	220	1296.85	1296.87
	J12	240	1297.04	1297.06
	J13	260	1297.24	1297.26
	J14	280	1297.43	1297.45
	J15	300	1297.62	1297.63
	J16	320	1297.81	1297.81
	RISER	340	1298.00	1298.02

ABOVE PIPING DATA FOR LENGTHS OF PIPE ARE BASED ON NOMINAL LENGTHS AND DO NOT INCLUDE CREEP

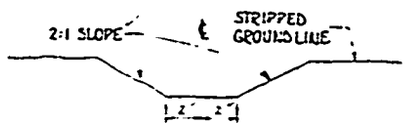
COLLAR	DISTANCE FROM OUTLET	INVERT OF 30" DIAMETER PIPE
I	190	1296.57
II	210	1296.75
III	230	1296.95
IV	250	1297.14
V	270	1297.33
VI	290	1297.52
VII	310	1297.72
VIII	330	1297.90

WHEN PIPE IS SPLICED IN LENGTHS OTHER THAN SHOWN, THE ENGINEER WILL PROVIDE THE CONTRACTOR WITH A REVISION OF THIS SHEET

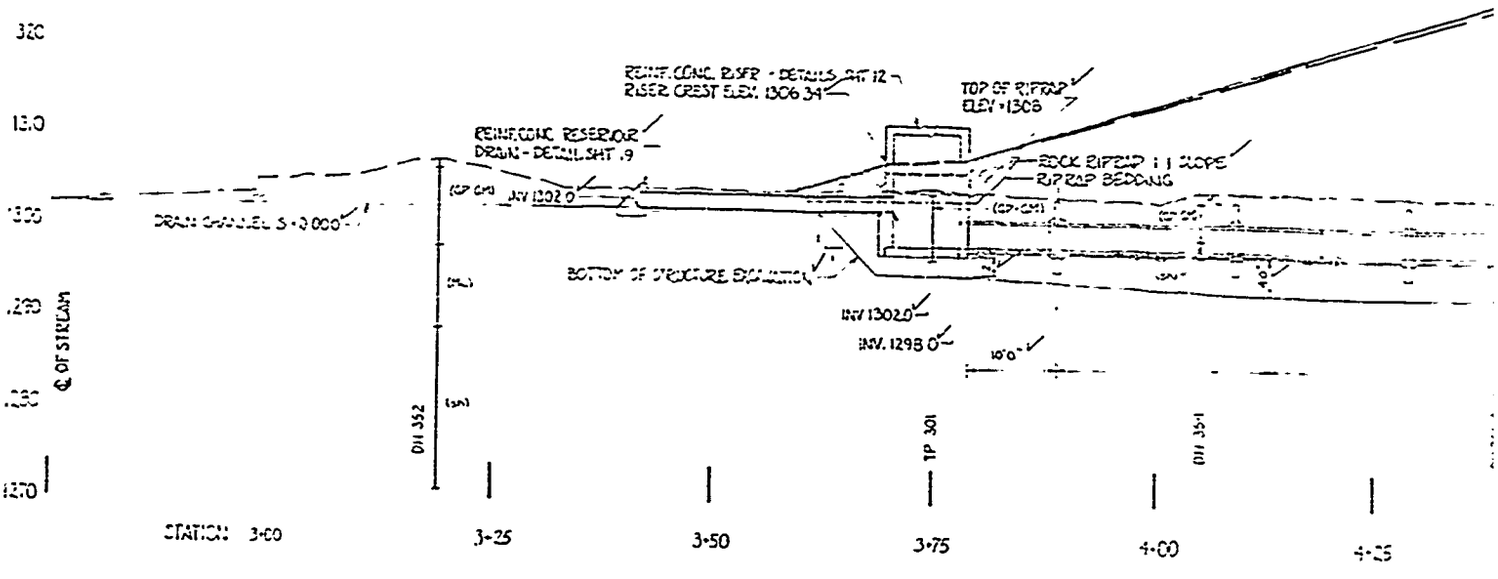


PLAN VIEW

0 5 0 5 0 15 20 25 30 FEET

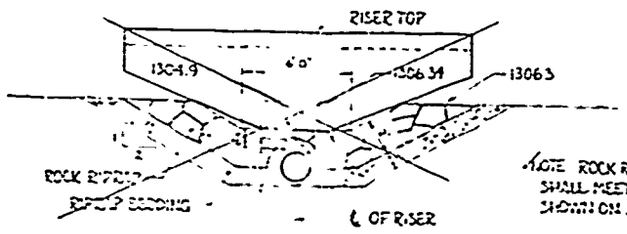


SECTION A-A - DRAIN CHANNEL (TYPICAL)
NO SCALE



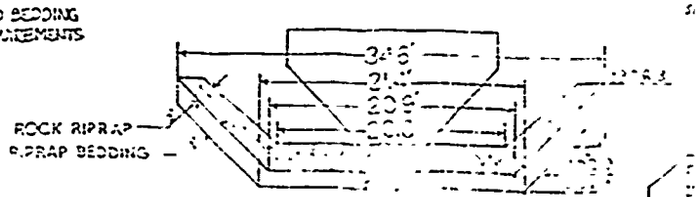
CENTERLINE PROFILE OF PRINCIPAL SPILLWAY

0 5 0 5 0 15 20 25 30 35 FEET

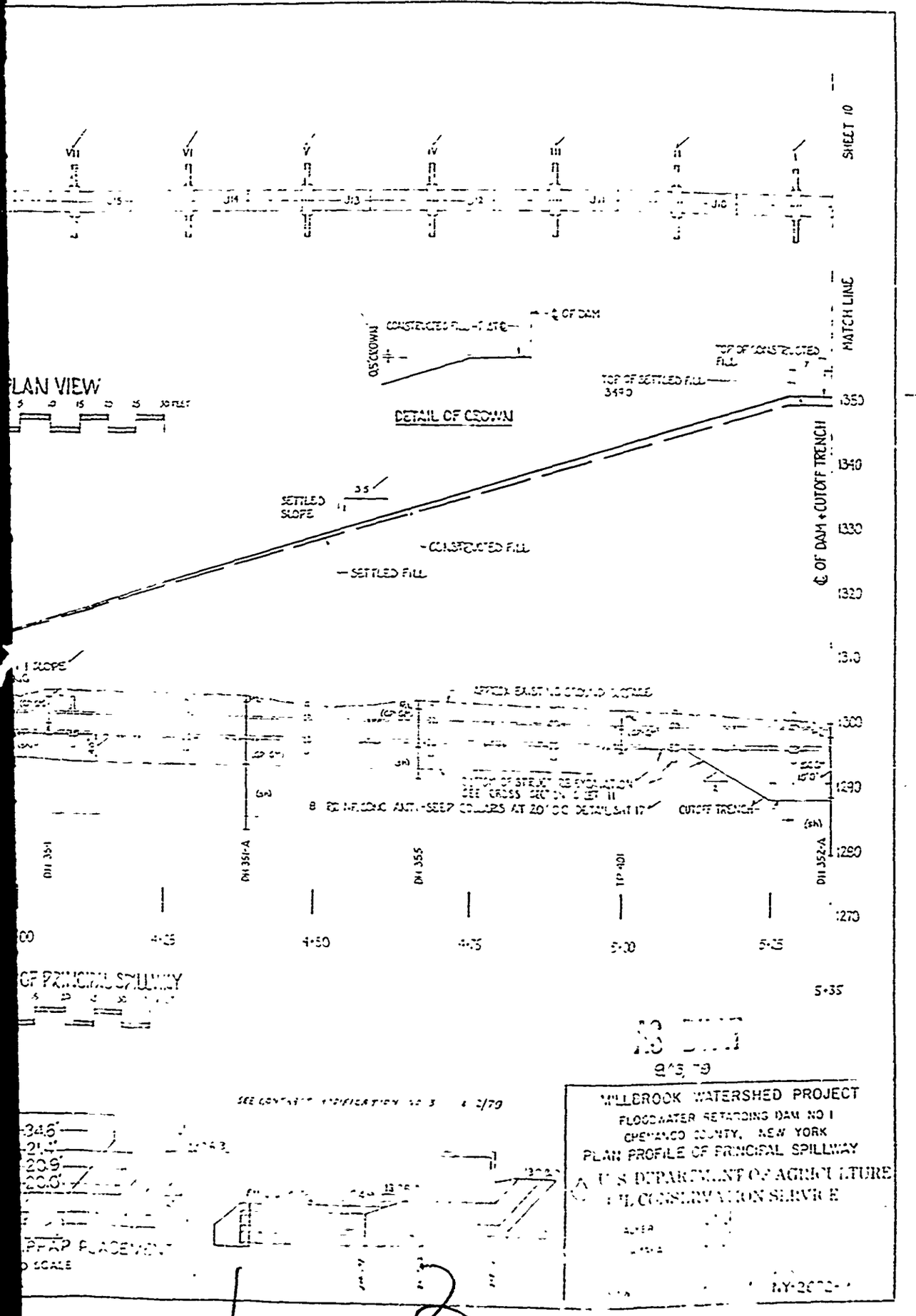


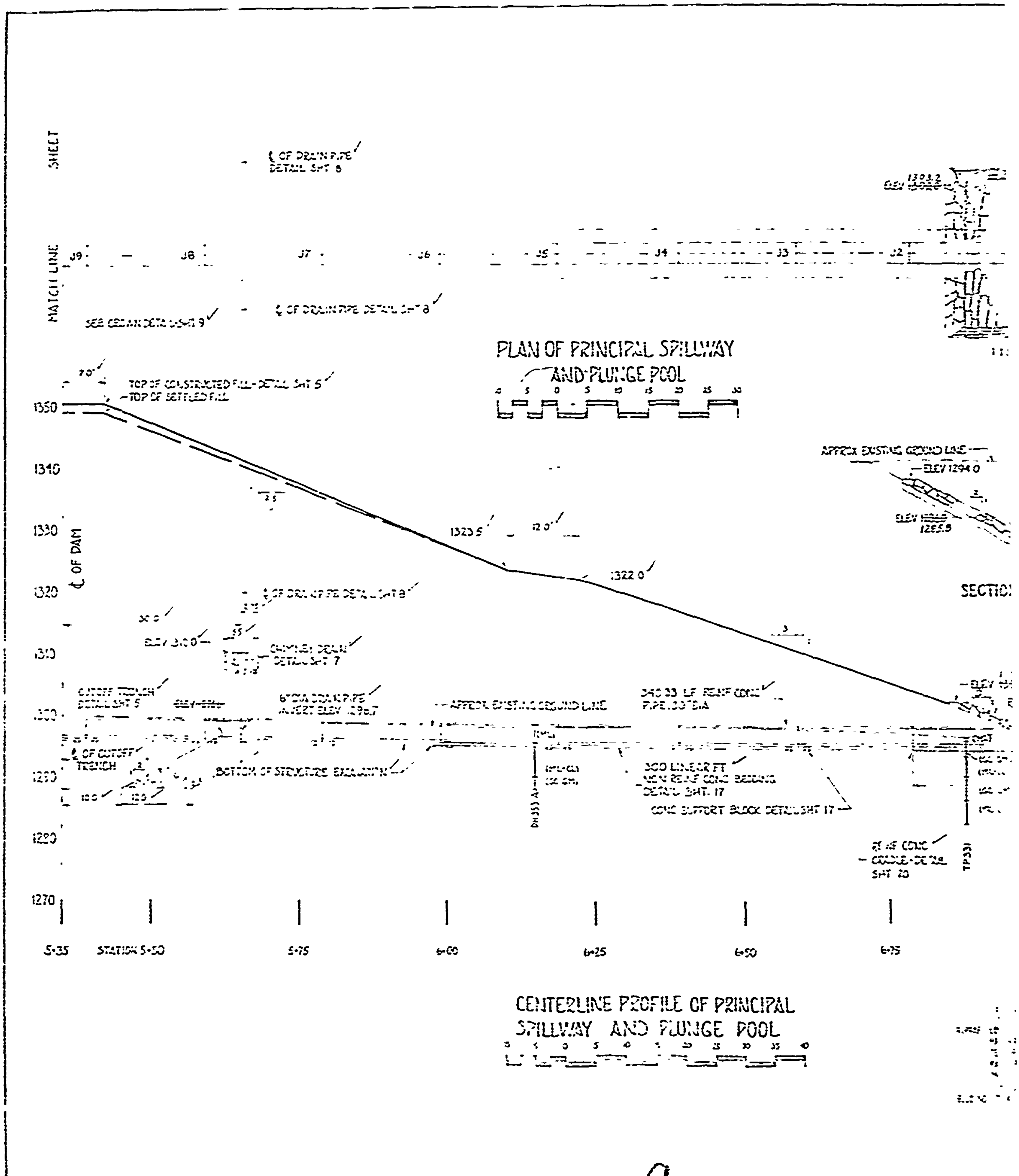
NOTE ROCK RIPRAP AND BEDDING SHALL MEET THE REQUIREMENTS SHOWN ON SHEET 10

(SECTION B-B RIPRAP PLACEMENT AT RISER
NO SCALE
(CHANGED PER MODIFICATION NO. 3)

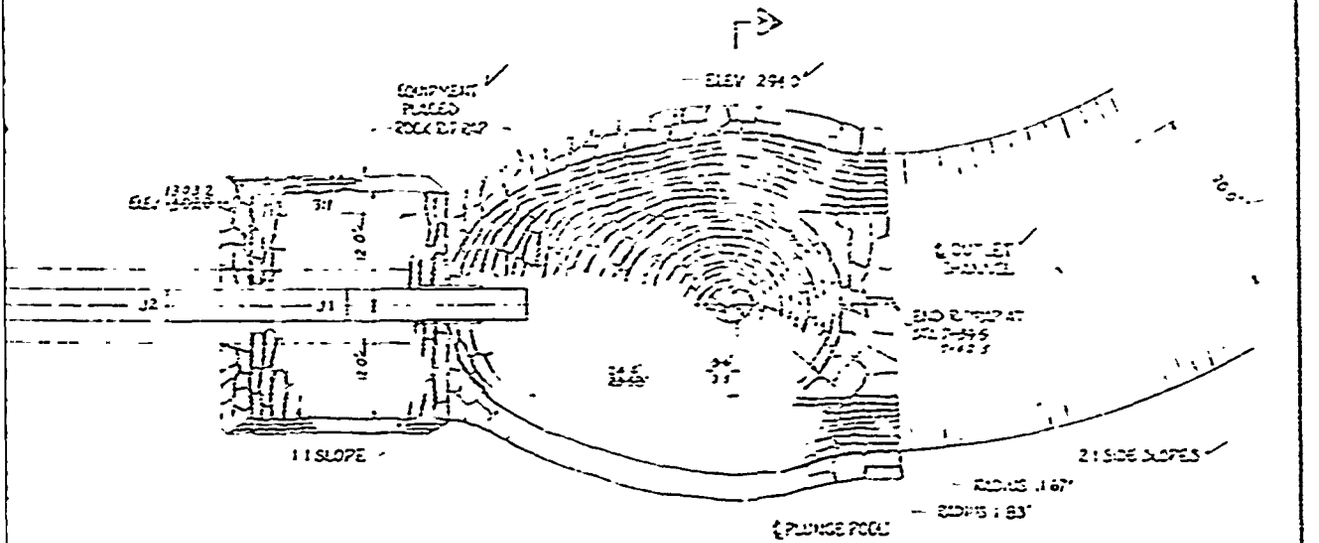


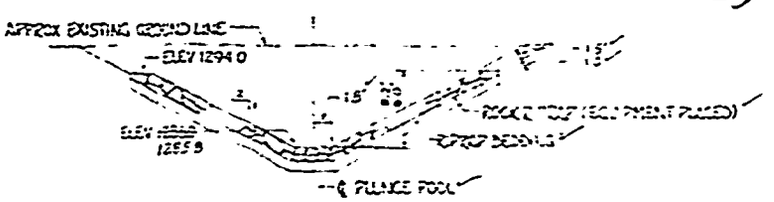
SECTION B-B RIPRAP PLACEMENT
NO SCALE


SHEET 10
MATCH LINE
PLAN VIEW
DETAIL OF CROWN
SETTLED SLOPE
CONSTRUCTED FILL
SETTLED FILL
℄ OF DAM + CUTOFF TRENCH
CUTOFF TRENCH
DH 351
DH 351-A
DH 355
TP 401
DH 352-A
1350
1340
1330
1320
1310
1300
1290
1280
1270
4+00
4+25
4+50
4+75
5+00
5+25
5+35
OF PRINCIPAL SPILLWAY
MILLBROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
CHENANGO COUNTY, NEW YORK
PLAN PROFILE OF PRINCIPAL SPILLWAY
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

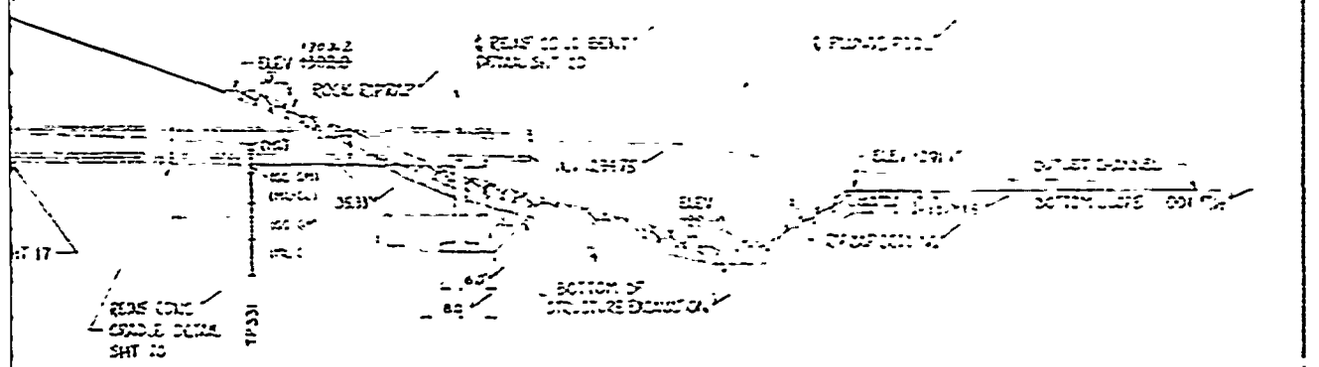

SHEET
MATCH LINE
PLAN OF PRINCIPAL SPILLWAY AND PLUNGE POOL
TOP OF CONSTRUCTED FILL - DETAIL SHT 5
TOP OF SETTLED FILL
APPROX EXISTING GROUND LINE
ELEV 1294.0
1323.5
1322.0
℄ OF DAM
SECTION
CHIMNEY DRAIN DETAIL SHT 7
6" DIA DRAIN PIPE
APPROX EXISTING GROUND LINE
BOTTOM OF STRUCTURE EXCAVATION
300 LINEAR FT
CONC SUPPORT BLOCK DETAIL SHT 17
STATION 5+50
5+35
5+75
6+00
6+25
6+50
6+75
1350
1340
1330
1320
1310
1300
1290
1280
1270
CENTERLINE PROFILE OF PRINCIPAL SPILLWAY AND PLUNGE POOL

7



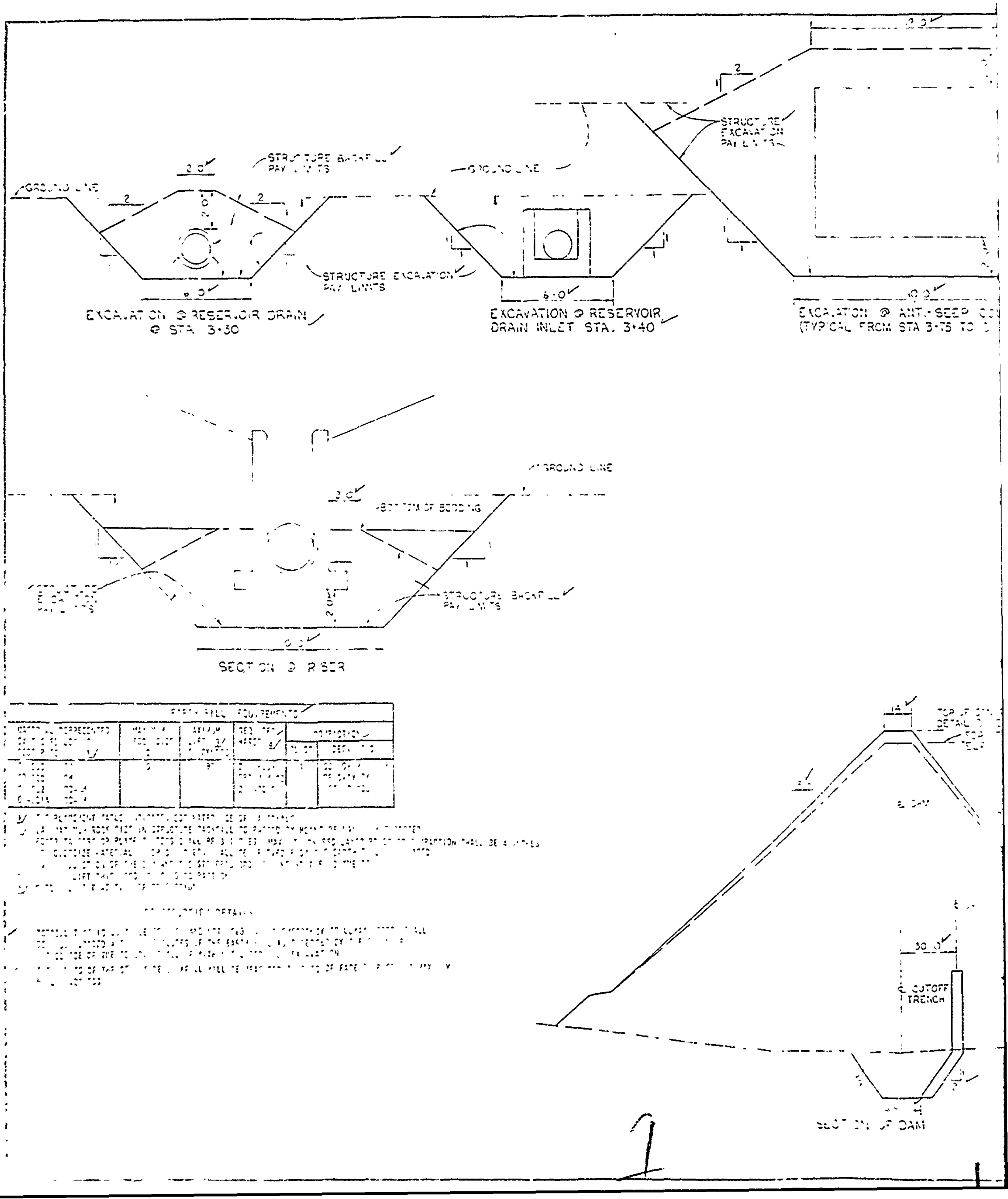


SECTION A-A

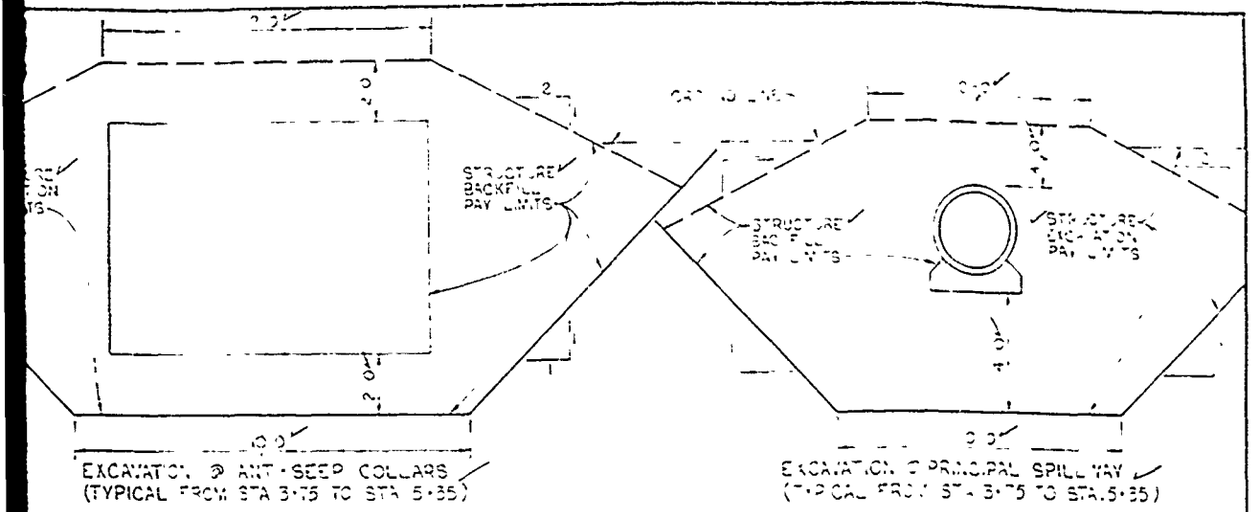


WILLOCK WATERSHED PROJECT
PLUNGE POOL
U.S.

2

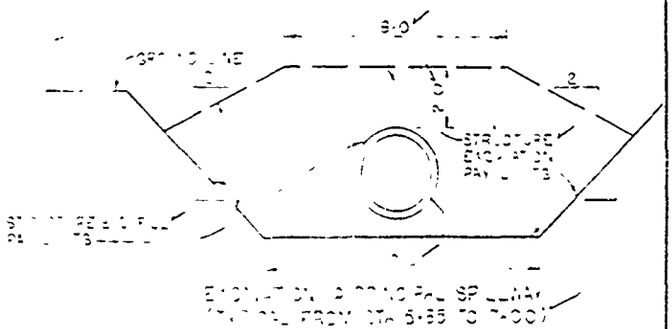


GROUND LINE
STRUCTURE BACKFILL PAY LIMITS
STRUCTURE EXCAVATION PAY LIMITS
EXCAVATION @ RESERVOIR DRAIN @ STA 3+50
EXCAVATION @ RESERVOIR DRAIN INLET STA. 3+40
EXCAVATION @ ANTI-SEEP
(TYPICAL FROM STA 3+75 TO
BOTTOM OF BEDDING
SECTION @ RISER
EARTH FILL REQUIREMENTS
COMPACTION
CUTOFF TRENCH
SECTION OF DAM

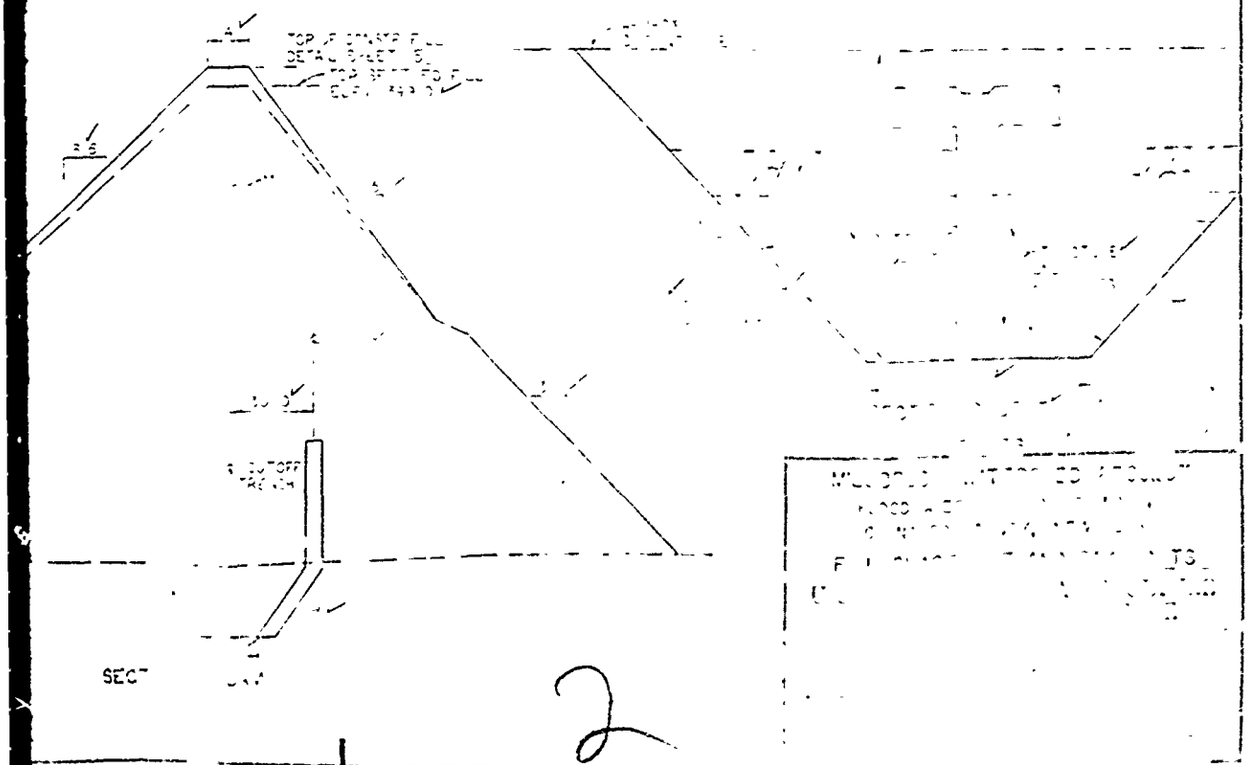


EXCAVATION @ ANTI-SEEP COLLARS (TYPICAL FROM STA 3+75 TO STA 5+35)

EXCAVATION @ PRINCIPAL SPILLWAY (TYPICAL FROM STA 3+75 TO STA 5+35)

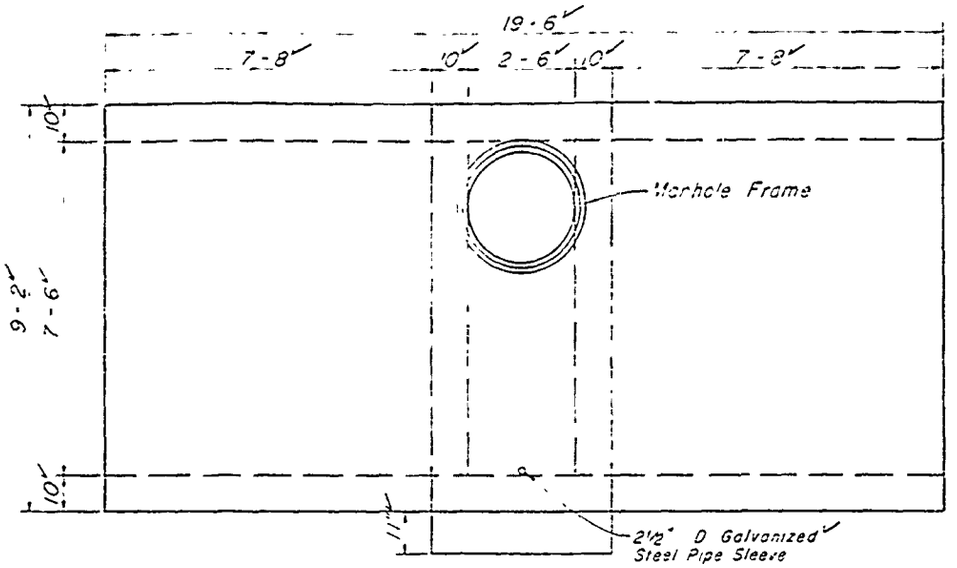


EXCAVATION @ PRINCIPAL SPILLWAY (TYPICAL FROM STA 5+35 TO STA 7+00)



SECT

2



PLAN - TOP

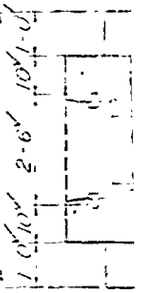
MANHOLE ASSEMBLY DETAIL

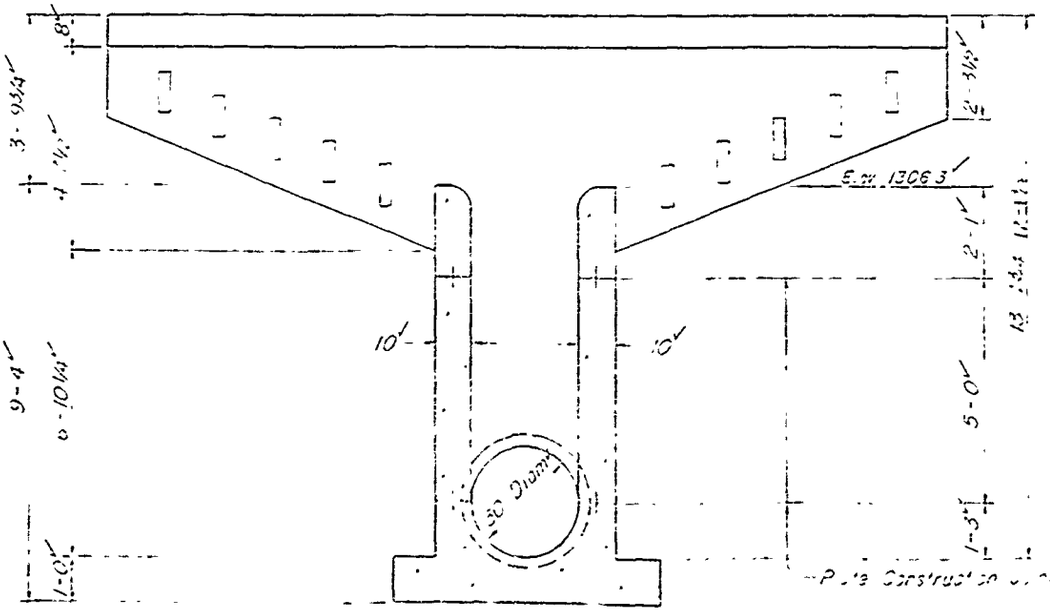
Circular Manhole Assembly Minimum Clear Opening 32" Neenah Foundry Co Model R-6461-HM With Stainless Steel Cap Screws, or Equivalent

The Lifting Device Shall Consist of a Hole approx. 3" From the Outside Perimeter of the Lid

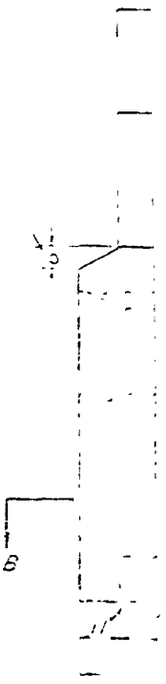
The Locking Device Shall Consist of a Hook at One Edge of the Lid Unitized to and a Rotating Bar With a Hex Bolt at the opposite edge

(SEE S.D.D. No. XXX-XX)





SECTION A-A



¼" x 6" Carbon steel plate to conform to Spec. 55. Continuous Thru Construction Splices Shall Be Either Full Depth Welded

1

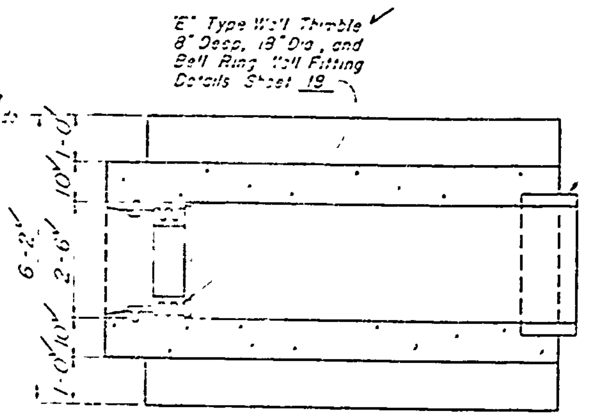
ASSEMBLY DETAIL

hole Assembly ... 30" ... or Equivalent

Device Shall Consist of a 3" From the Outside the Lid

Device Shall Consist of a Edge of the Lid ... Bar with a Hex Bolt ... edge

Construction Details Sheet 15

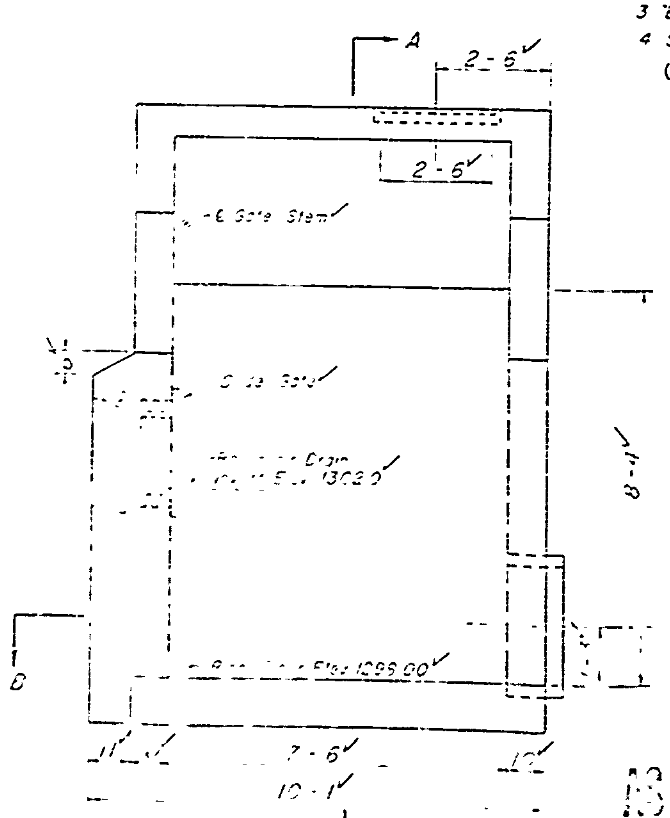


SECTION B-B

SLIDE GATE DETAILS

1. 18" Dia Flat Frame Slide Gate Class O-20
2. Gate shall Conform to Spec 573 and shall be MHS-1
3. "E" Type Wall Thimble 8" Deep
4. Stem shall be Stainless Steel.

(SEE SHOP DRAWINGS, ATTACHED)



SIDE ELEVATION

MATERIAL DESCRIPTIONS

A

Gravel, [illegible], poorly graded - 18" max. size, usually 12", varied lithology; approx. [illegible], 6% 3-6", 70% matrix (which is approx. 60% gravel, 30% sand, and [illegible] non-plastic fines); brown; wet to saturated; rapid permeability, [illegible]; loose-medium, N=5-35, usually <20; alluvial and outwash gravel; [illegible]

(D.S. 1.1, GP-GM)

B

Gravel, silty-clayey - 18" max. size, varied lithology; approx 15+6", [illegible] 3-6", [illegible] matrix (which is approx. 25-30% gravel, 20-31% sand, and [illegible] non-slightly plastic fines, LL=16-25, PI=1-4); brown, changing to gray w/depth; moist; slight permeability; loose-dense, N=6-200, usually [illegible]; glacial till; GC-GM

(D.S. 3.1, SM: 201.1, GC; 206.1, GC-GM)

C

Sand, silty - 18" max. size, varied lithology; 15+6", 1% 3-6", 98% matrix (which is approx. 22% gravel, [illegible] sand and 16% non-plastic fines); gray brown; moist-saturated; moderate permeability; medium-very dense, N=21-62, [illegible]; lacustrine; SM

(D.S. 1.1, SM)

D

Silt, w/little sand and gravel - 2" max size; 100% matrix (which is approx. [illegible] gravel, 15 sand and 95% non-plastic fines); brown; moist; slight permeability; loose-very dense, N=21-150, [illegible]; lacustrine; ML

(D.S. 1.2, ML)

E

Topsoil - gravel, sand and silt w/roots and organic material; brown; moist; moderate permeability; loose; ave thickness 1.0'; ML

F

Shale w/some small interbedded sandstone layers; fine grained; moderately [illegible], gray; moderately hard; thin bedded (usually 1-3"); highly [illegible]; [illegible] breaks into walnut sized pieces or smaller; [illegible]; joint system [illegible] W, [illegible]E; Genesee Co, [illegible]; SP

G

[illegible] silt w/sand and gravel; gray; moist; moderate plasticity; slightly [illegible]; glacial till; CL-CL

TP #1, Centerline of Dam, 5/8/69, EM, 1372.1

0.0 - 1.0	E	Topsoil
1.0 - 9.0	C	Gravel - sandy, silty 18" max. - varied shape and lithology Approx. 1% - 6", 1% 3-6", 98% matrix (which is approx. 40% gravel, 40% sand and 20% non-plastic fines) Gray brown; moist-saturated; moderate-rapidly permeable; loose; lacustrine; GM D.S. 1.1 (SM)
9.0 - 12.0	D	Sand - silty, w/gravel 2" max. 100% matrix (which is approx. 5% gravel, [illegible] and 35% non-plastic fines) Brown; moist; slight to moderately permeable; loose, lacustrine; SM D.S. 1.2 (ML)
12.0 - 15.0	C	Gravel - sandy, silty 18" max. - varied shape and lithology Approx. 1% - 6", 1% 3-6", 98% matrix (which is approx. 40% gravel, 40% sand and 20% non-plastic fines) Gray brown; moist-saturated; moderate-rapidly permeable; loose; lacustrine; GM D.S. 1.1 (SM)

Note: Test pit dug partially in left abutment and partially in flood plain; heavy seepage @ 6.0 ft.

TP #2, Centerline of Dam, 5/8/69, EM, 1334.1

0.0 - 0.5	E	Topsoil
0.5 - 10.0	A	Gravel - sandy, silty, poorly graded 18" max. - varied shape and lithology Approx. 2% + 6", 6% 3-6", 92% matrix (which is approx. 50% gravel, 40% sand and 10% non-plastic fines). Brown; saturated; rapidly permeable; loose; alluvial gravel and outwash; GP-GM D.S. 1.1 (GP-GM)

Note: Pit walls cave in readily; heavy seepage @ 2.0 ft.; Pit abandoned @ 10.0 ft. due to caving and excess water; no indication of any change in material. Water level @ 4.0'

TP #3, Centerline of Dam, 5/8/69, EM, 1372.9

0.0 - 1.0	E	Topsoil
1.0 - 15.0	B	Gravel - silty, sandy 18" max. - various shape and lithology Approx. 1% + 6", 1% 3-6", 98% matrix (which is approx. 35% gravel, 30% sand and 35% [illegible]) Brown; moist; slightly permeable; [illegible] till; GM D.S. 3.1 (SM)

Note: Till color has become grayer [illegible] ft. due to oxidation; [illegible] has become dense w/[illegible] about 25-30% below [illegible]

TP #4, [illegible], 5/9/69, EM, 1315.2

0.0 - 1.0	E	Topsoil
1.0 - 15.0	B	Gravel - silty, sandy 24" max. - varied shape and lithology Approx. 1% + 6", 1% 3-6", 98% matrix (which is approx. 35% gravel, [illegible] sand and [illegible] plastic fines) Brown; moist; slightly permeable; [illegible]

TP #5, [illegible], 5/9/69, EM, [illegible]

0.0 - 1.0	E	Topsoil
1.0 - 15.0	B	Gravel - silty, sandy 19" max. - varied shape and [illegible] Approx. 1% + 6", 1% 3-6", [illegible] 35% gravel, 25% sand, and [illegible] Brown to gray @ 12.0 ft.; moist; [illegible] dense; till; GM D.S. 201.1 (GC)

TP #6, [illegible], 5/9/69, EM, [illegible]

0.0 - 1.0	E	Topsoil
1.0 - 14.0	B	Gravel - silty, sandy [illegible] - varied [illegible] Approx. 1% + 6", 1% 3-6", [illegible] [illegible] gravel, [illegible] sand [illegible] Brown; moist; slightly [illegible]
14.0 - 15.0	B	Gravel - silty, [illegible] [illegible] [illegible] Gr[illegible] [illegible]

TP #7, [illegible] Channel, [illegible]

0.0 - 2.5		Alluvial [illegible]
2.5 - 6.0	A	Gravel - [illegible] 18" max. - [illegible] Approx. [illegible] 50% gravel [illegible] Brown, saturated [illegible] gravel, [illegible]

Note: GWL @ [illegible]

[illegible], [illegible], 5/[illegible]/69

0.0 - 0.5	E	Topsoil
0.5 - 5.0	A	Gravel - sandy [illegible] 18" max. - [illegible] Approx. [illegible] 40% gravel [illegible] Gray brown [illegible] gravel, [illegible]
5.0	F	Bedrock

TP #[illegible], Main Line, 5/12/69

0.0 - 0.5	E	Topsoil
0.5 - 5.5	A	Gravel - sandy [illegible] 18" max. - [illegible] Approx. [illegible] 50% gravel, [illegible] Brown; saturated [illegible] gravel, [illegible]

Note: Water [illegible] pit; [illegible] 4.0 ft.

1

TP [illegible] [illegible], 5/[illegible]/69, [illegible], 1304.5

0.0 – 0.3 Topsoil

0.3 – 9 Gravel – sandy, silty
13" max. – varied shape and lithology
Approx. [illegible] + 6", 5% 3-6", 90% matrix (which is approx. 45% gravel, 35% sand and 20% non-plastic fines)
A
Gray brown, wet; rapidly permeable, loose; alluvial gravel, outwash; GM

9.0 Bedrock

TP [illegible] Outlet Channel, 5/12/69, [illegible], 1301.4

0.0 – 2.5 Alluvial silt w/muck and peat

2.5 – 6.0 Gravel – sandy, silty
13" max. – varied shape and lithology
A
Approx. [illegible] + 3", 6% 3-6", 91% matrix (which is approx. 50% gravel, 40% sand and 10% non-plastic fines)
Brown, saturated; rapidly permeable; loose, alluvial gravel, outwash; GP-GM

Note: GWL @ ground surface

TP [illegible] Drain Line, 5/12/69, [illegible], 1304.9

0.0 – 0.5 Topsoil

0.5 – 5.5 Gravel – sandy, silty
13" max. – varied shape and lithology
A
Approx. [illegible] + 6", 5% 3-6", 90% matrix (which is approx. 50% gravel, 40% sand and 10% non-plastic fines)

Brown; saturated; rapidly permeable; loose; alluvial gravel, outwash; GP-GM

Note: Material is moist in upper portion of test pit; contains 20-25% fines. Water level @ 4.0 ft.

LEGEND

TEST HOLE NUMBERING SYSTEM

	Test Pit (TP)	Drill Hole (DH)
Centerline of Dam	[illegible]	[illegible]-49
Borrow Area	1 1-1 49	1[illegible]0-149
Emergency Spillway	[illegible]-249	[illegible]-294
Centerline of Outlet Structure	3 1-349	[illegible]-399
Outlet Channel	401-449	4[illegible]-499
Drain Line	5[illegible]1-549	[illegible]-599
Other	[illegible]	[illegible]-699

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOLS

GW Well graded gravels; gravel-sand mixtures [illegible]
GP Poorly graded gravels
GM Silty gravels; gravel-sand-silt mixtures
GC Clayey gravels, gravel-sand-clay mixtures
SW Well graded sands; [illegible]
SP Poorly graded sands [illegible]
SM Silty sands; sand-silt mixtures [illegible]
SC Clayey sands; sand-clay mixtures [illegible]
ML Silts; silty, [illegible] fine sands; [illegible]
CL Clays of low to medium plasticity; silty, sandy or gravelly clays
CH Clays of high plasticity; fat clays
MH Elastic silts; micaceous or diatomaceous silts
OL Organic silts and organic silty clays of low plasticity
OH Organic clays or silts of medium to high plasticity.

XX Unified Classification by visual inspection in the field

(XX) Unified Classification by laboratory analysis

Key to Drill Hole (DH) Logs

A	B	Material (USCS)	Depth (ft)
[illegible]		No. [illegible] of blows required [illegible] 1 ft. standard penetration [illegible] O.D. [illegible] sampler, [illegible] hammer [illegible] drop (ASTM D [illegible])	
DBS RB		Dry barrel sampler; Roller bit to advance hole [illegible] wash boring	[illegible]
AUG		Hole advanced by auger	[illegible]
NX [illegible]	4.21 fpd	Rock core, [illegible] diameter; Percent rock core recovery – each drill run / RQD; Permeability test (fpd) – [illegible]	[illegible]

RQD – Rock Quality Designation = total length of pieces > 4" / length of core run [illegible]

[illegible] OF [illegible] FOR LOCATION OF DRILL HOLES AND TEST PITS.

2

BORING LOGS

Centerline C/L

BH #51, C/L Sta., 5/21-5/23/69, SM, 1352.5 — 0.0

B — 14, 13, 15, 31, 35, 55, 41, 77, 100/.3, ATD
Gravel - silty, clayey
Approx. 30% gravel, 25% sand, 45% slightly plastic fines
Brown, moist, slightly permeable; medium - very dense, N=16-100; till; GC-GM
— 13.5

C — 62, 99, 100/.5, ATD, 170, 125, 95, 126, 98, 131, 86, 41
Sand - silty
Approx. 25% gravel, 60% sand, 15% nonplastic fines
Gray-brown; moist; moderately permeable; dense - very dense, N=41-100+; lacustrine; SM
— 30.0

D — 40, 39, 158
Silt - sandy
Approx. 1% gravel, 1% sand, 98% nonplastic fines
Brown; moist; slightly permeable; dense - very dense, N=38-100+; lacustrine, ML
— 34.5

B — 80, 118, 124/.5, ATD, 100/.5, 100/.5
Gravel - silty, clayey
Approx. 30% gravel, 25% sand, 45% slightly plastic fines
Brown; moist, slightly permeable; very dense, N=60-100+; till, GC-GM
— 40.0

Note: GWL 419.5' 5/24/69

BH #52, C/L Sta., 5/26/69, SM, 1326.6 — 0.0

E — 7
Topsoil - silt, gravelly
Brown; moist, moderately permeable; soft, N= 7; ML
— 1.0

B — 38, 20, 23, 8, 23, 43
Gravel - silty, clayey
Approx. 30% gravel, 25% sand, 45% nonplastic fines
Brown; moist-wet, slight - moderately permeable; loose - very dense; N=8-43; till; GM
— 16.5

C — 7, 33, 57, 66, 63, 57
Sand - silty
Approx. 25% gravel, 60% sand, 15% nonplastic fines
Gray-brown; wet; moderately permeable; loose - very dense, N=7-66, lacustrine; SM
— 25.5

BH #54, C/L Sta., 5/27/69, SM, 1305.4 — 0.0

A&D — 23
Miscellaneous gravels sands and silts
— 29.0

F — 100
Probable weathered shale, refusal on solid rock 431.5 ft.
— 31.5

BH #251, Serv. Spwy., 5/21-5/22/69, SM, 136..3 — 0.0

E — 7
Topsoil - silt, gravelly
Brown; moist; moderately permeable; medium density, N= 7; ML
— 1.0

B — 23, 34, 28, 27, 23, 39, 84/.9, ATD, 69, 24, 90/.5, ATD, 69, 27, 28, 132, 28, 100/.5, 27, 72
Gravel - clayey
Approx. 30% gravel, 25% sand, 45% slightly plastic fines
Brown; moist; slightly permeable; medium-very dense, N=14-100+; till GC
— 40.5

Note: GWL at 4' 5/22/69

BH #252, Serv. Spwy., 5/23/69, SM, 1362.1 — 0.0

E — 10
Topsoil - silt, gravelly
Brown, moist; moderately permeable, soft, N<10. ML
— 1.0

B — 8H, 23, 8H, 15, 8H, 34, 50, 14, 24, 52, 42, 56, 8H, 179/.9, 8H, 154/.9, 8H, 200/.4, 8H, 138/.5, 8H, 160/.5
Gravel - silty, clayey
Approx. 30% gravel, 25% sand, 45% slightly plastic fines
Brown, moist-wet; slightly permeable; medium-very dense, N=14-100+, till, GC-GM
— 48.5

Note: Till is wet - saturated between 16.5-22.0 ft. Color changes to gray brown @ 22 ft. and to gray @ 45 ft. GWL 22.3 ft. 5/23/69.

BH #351, Prin. Spwy., 5/26-5/27/69, MA, 1306.5 — 0.0

E — 12
Topsoil - silt, gravelly
Brown; moist; moderately permeable; medium consistency, N<12; ML
— 1.0

A — 25, 14, 11, 14, 21, 12, 19
Gravel - sandy, poorly graded
Approx. 65% gravel, 26% sand, 9% nonplastic fines
Brown; wet - saturated; highly permeable, medium density, N=11-25; outwash; GP-GM
— 13.0

D — 66, 21, 29, 35, 31, 38, 28, 28, 44, 30, 24, 26, 38, 33, 42, 36, 39, 40, 46, 62, 37, 32, 32, ATD
Silt - w/little sand and gravel
Approx. 1% gravel, 4% sand, 95% nonplastic fines
Brown; moist-wet; slightly permeable; medium-very dense, N=21-66; lacustrine; ML
— 52.0

F
Bedrock
— 52.0+

Note. Silt contains many sand lenses throughout. GWL @ creek level.

BH #352, Prin. Spwy., 5/23-5/27/69, SM, 1306.5 — 0.0

E — 11
Topsoil - silt, gravelly
Brown; moist; moderately permeable; medium consistency, N<11; ML
— 1.0

A — 5, 7, 8, 35, 60
Gravel - silty, poorly graded
Approx. 65% gravel, 26% sand, 9% nonplastic fines
Brown; wet-saturated; highly permeable; loose-very dense, N=5-60; outwash; GP-GM
— 9.0

D — 50, 31, 35, 29, 80, 118
Silt - w/little sand and gravel
Approx. 1% gravel, 4% sand, 95% nonplastic fines
Brown; moist-wet; slightly permeable; medium-very dense, N=31-118+; lacustrine; ML
— 3.0

continued

BH #352 (continued)

F — 110, 100/.5, 100/.3, ATD, 100/.3, 33, 100, 100 (5.5 ft), 100 (1" ft)
Sandy shale w/... ... ... gray, moist... Solid, weathered ... with soil from ... highly fractured ... especially 23.5-25...

Note GWL 21.3 ft

BH #354, Prin. Spwy., 5/27/69, SM, 1304...

A — 29 — Sand and gravel

F — ATD — Shale; refusal on sol...

BH #355, Prin. Spwy., 5/27/69, SM, 1303...

A — 28 — Sand and gravel

F — ATD — Shale; refusal on sol...

Present C/L

BH #51A, C/L Sta., 5/31/69, SM, 1339...

B — 3, 23, 41, 23, 12, 28, 20
Gravel - silty, clay...
Approx. 30% grave...
slightly plastic fi...
Brown; moist; sligh...
loose-dense, N=3-4...

C — 71, 58
Sand-silty
Approx. 25% gravel, ...
nonplastic fines
Brown; moist; moder...
very dense, N=71, ...

B — 46, 23, 43, 23, 47, 23, 70
Gravel - silty, clay...
Approx. 30% grave...
slightly plastic f...
Brown; moist; slig...
loose-dense, N=3-4...

Note: Color of till ... brown 430.0 ... 431.0 ft.

BH #51A, C/L Sta., 6/5-6/10/69, SM, 1331...

E — Topsoil

A — 23, 40, 23 (26.1 ft)
Gravel - silty, poor...
Approx. 65% gravel, ...
nonplastic fines
Brown; wet-saturated; ...
dense, N=40; outwa...

B — 55, 58
Gravel - silty, clay...
Approx. 30% grave...
slightly plastic f...
Brown, changing to gr...
moist; slightly per...
dense, N=55, till.

F — 50/.0, ...
Sandy shale w/some ... sandstone layers, ... moderately weathere... moderately hard, ... small fracture zone... 13.0-15.6' at

Note: GWL 41.3'

BH #51B, C/L Sta., 6/5/69, SM, 1325.0

E — 25
Topsoil - silt, grave...
Brown; moist; modera...
stiff, N<25; ML

B — 23, 37, 34, 31, 31, 31, 32, 29
Gravel - silty, claye...
Approx. 30% gravel, ...
45% slightly plasti...
Brown; moist; sli...
medium-very dense, ...
till. GC-GM

[illegible] #352 (continued) — 19.0

F — 110, 100/[illegible], 100/3, [illegible], 100/3, [illegible], [illegible], 100/[illegible] 5.7 [illegible], 100/[illegible]
Sandy shale w/some small [illegible] [illegible]; gray, moderately [illegible]; Bedded; weathered shale mixed with soil from 19.0-20.5 ft.; highly fractured [illegible]; especially 25.5-29.0 ft. sh
— 35.5

Note GWL [illegible] ft 5/27/69

DH #354, Prin. Spry., 5/27/59, CM, 1304.1 — 0.0

A — SH — Sand and gravel — 5.5
F — 100 — Shale; refusal on solid rock @7.0 ft. — 7.0

DH #355 Prin. Spry., 5/27/59, CM, 1302.9 — 0.0

A — SH — Sand and gravel — 7.0
F — 100 — Shale; refusal on solid rock @11.5 ft. — 11.5

[illegible]

DH #51A C.L. Dam, 5/21/59, CM, 1339.8 — 0.0

B — 3, [illegible], 41, [illegible], 22, [illegible], 20
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Brown, moist; slightly permeable, loose-dense, [illegible]; till; GC-GM
— 20.0

C — 71, [illegible]
Sand-silty
Approx. 25% gravel, 60% sand, 15% nonplastic fines
Brown; moist; moderately permeable; very dense, [illegible], lacustrine, SM
— 25.0

B — 46, [illegible], 43, [illegible], 49, [illegible], 70
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Brown; moist; slightly permeable; loose-dense, [illegible], till; GC-GM
— 40.0

Note Color of till changes to gray brown @36.0 ft. and to gray @38.0 ft.

DH #[illegible], C/L Dam, 6/5-6/10/69, CM, 1301.7 — 0.0

E — Topsoil — 0.5

A — [illegible], 43 [illegible], [illegible]
Gravel - silty, poorly graded
Approx. 67% gravel, 24% sand, 9% nonplastic fines
Brown; wet-saturated; rapidly permeable; dense, [illegible]; [illegible]; GP-GM
— 10.0

B — 56, [illegible]
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Brown, changing to gray @11.0 ft.; moist, slightly permeable; very dense, [illegible], till, GC-GM
— 13.0

F — 50/.0, [illegible], 100/[illegible]
Sandy shale w/some small interbedded sandstone layers; fine grained; moderately weathered, gray; moderately hard, thin bedded; small fracture zones approx. 15.0-15.6' sh
— 18.0

Note: GWL [illegible]

DH #5[illegible], C/L Dam, 6/[illegible]/69, CM, 1325.0 — 0.0

E — 25
Topsoil - silt, gravelly
Brown, moist; moderately permeable; stiff, [illegible] 25; ML
— 1.0

B — [illegible], 37, [illegible], 31, [illegible], [illegible], [illegible], 29
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Brown, moist, slightly permeable; medium-dense, [illegible]; till GC-GM
— 21.5

DH #[illegible]A, C/L Dam, 6/21/69, CM, 1305.4 — 0.0

E — [illegible] — Organic soil; Black; saturated, soft — 3.0
B — [illegible] — Gravel - sandy, silty; Brown — 6.0
F — [illegible] — Bedrock — 6.0

DH #353A, [illegible] Spry., 6/5/69, CM, 1371.7 — 0.0

E — 12
Topsoil - silt, gravelly
Brown; moist; moderately permeable; medium consistency, [illegible] 12; ML
— 2.0

B — [illegible], 19, [illegible], 35, [illegible], 100/.4, [illegible], 67, [illegible], 62, [illegible], 56
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Brown; changing to gray @10.0 ft.; moist; slightly permeable; medium-very dense, [illegible]; till; GC-GM
— 11.5

DH #352, Prin. Spry., 5/5-6/5/59, CM, 1303.5 — 0.0

A — SM — Earth boring, probing for rock. — 10.3

F — [illegible], 100/[illegible] 5.0 [illegible]
Sandy shale w/some small interbedded sandstone layers; fine grained; moderately weathered; gray; moderately hard; thin bedded; small fracture zones @16 & 17.0'; no vertical seams; sh
— 20.3

Note: GWL @1.3 ft. 6/5/69

DH #352A, Prin. Spry., 6/10/69, CM, 1300.4 — 0.0

E — 3 — Organic soil; Black; wet; soft — 2.5

B — [illegible], 29, [illegible], 59, [illegible]
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Gray; moist; slightly permeable; medium-very dense, [illegible]; till; GC-GM
— 12.0

F — [illegible], [illegible]/[illegible] 3.4 [illegible]
Sandy shale w/some small interbedded sandstone layers; fine grained; moderately weathered; gray; moderately hard; thin bedded; fracture zone & vertical seam @13.0', large fracture zone @13.5' and 17.0'; sh
— 21.0

Note: GWL @1.3 ft. 6/10/69

DH #353A, Prin. Spry., 6/10/69, CM, 1296.7 — 0.0

E — 4 — Organic soil; Black; saturated; very soft — 3.0

B — [illegible], 23, [illegible], 100/.4
Gravel - silty, clayey
Approx. 30% gravel, 30% sand, 40% slightly plastic fines
Gray, moist, slightly permeable; medium-very dense, [illegible]; till. GC-GM
— 10.8

F — 100 — Shale — 10.9

SEE SHEET 2 OF 24 FOR LOCATIONS OF DRILL HOLES AND TEST PITS

[illegible]
5/3/79

MILL BROOK WATERSHED PROJECT
SITE 1
[illegible] COUNTY NEW YORK
LOGS OF TEST HOLES
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TP #131. S E. Corner Borrow 4/13 77 B Y 1358 3

0.0' - 1.0' Topsoil

E

1.0' - 10 3' Gravel-sand-clay mixture
12" max
B Approx 50-6". 10% 3-6". 55% matrix (which is approx 27% gravel 24% sand 49% slightly plastic fines)
Brown, moist slightly permeable stiff, glacial till
GC
D.S. 131.1 (GC)

Note Topsoil depth 1.0'

TP #231. E End Along E. Emer. Spill.. 4 13-77 B Y 1341 3

1.0' - 11.0' Gravel-sand-clay mixtures
12" max.
B Approx. 55-6". 15% 3-6". 30% matrix (which is approx 27% gravel, 24% sand, 49% slightly plastic fines)
Brown; moist; slightly permeable; stiff, glacial till.
GC

Note: Topsoil depth 1.0'

TP #232. S.E. Side of Emer Spill 4.13/77. B Y 1355 0

1.0' - 13 0' Gravel-sand-clay mixtures
12" max.
B Approx 55-6". 10% 3-6". 35% matrix (which is approx 27% gravel, 24% sand 49% slightly plastic fines)
Brown, moist, slightly permeable, stiff glacial till
GC

Note: Topsoil depth 1 0'

TP #331. S. End Prin. Spill 4 13 77. B Y. 1235 6

1.0' - 3.5' Silty gravels
5"-8" max.
A Approx. 5-6". 15% 3-6". 30% matrix (which is approx 50% gravel, 24. sand, 13. fines)
Dark brown wet, moderately permeable, medium, flood plain, GM-GC

3 5' - 7 0' Clayey silts
4" max.
G Approx. 0-6". 15% 3-6". 85% matrix (which is approx 15% gravel, 12% sand, 73% low plasticity)
Gray, moist, very slight permeability, very stiff, glacial till. CL-CL

7.0'-11.5' Silty gravels
6" max.
A Approx. 5-6" 20, 3-6". 75% matrix (which is approx 50% gravel, 24% sand, 13% fines)
Brown very wet, rapid permeability, loose, glacial till. GM-GC

11 0' -14.0' Clayey silts
4" max.
G Approx. 0-6". 15. 3-6". 85% matrix (which is approx 15% gravel, 12% sand, 73% low plasticity)
Gray, moist, very slightly permeable, very stiff, glacial till. CL-CL

Note: Topsoil depth 1.0'. Seepage in gravel layer below 7.0'. Bedrock @ 14.0'.

TP #531. N Side Drain Line 4 13 77 B Y 1259 3

1 0' - 3 0' Clayey silts
12" max
G Approx. 0-6" 10% 3-6" 35% matrix (which is approx 15% gravel 12% sand 73% slightly plastic fines.
Gray, moist very slightly permeable very stiff glacial till
CL-CL

Note Rock depth 1 0' This area has surface water seeps soft and mucky

3.0'- Very firm till

TP #532. S. Side Drain Line, 4/13/77. B.Y 1237 4

1 0' - 3 0' Silty gravels
5" - 8" max
A Approx. 50-6" 15% 3-6". 30% matrix (which is approx 50% gravel 24% sand 13% fines
Dark brown; wet, moderately permeable medium, flood plain, GM-GC) D.S 532 1 (GM-GC)

3.0' - 8 0' Clayey silts
3" - 5" max.
G Approx. 0-6". 10% 3-6" 90% matrix (which is approx 15% gravel, 12% sand, 73% low plasticity fines)
Gray, moist, very slightly permeable very stiff glacial till, CL-CL. D S 532 2 (CL-CL)

Note: Topsoil depth 1 0" Water seepage @ 1 5'

TP #533. S End Drain Line, 4/13/77. B.Y. 1318 3

1.0' - 11 0' Gravel-sand-clay mixtures
12" max
B Approx 55-6". 15% 3-6" 30% matrix (which is approx 27% gravel, 24% sand 42% slightly plastic fines)
Brown, moist, slightly permeable stiff glacial till,
GC

Note Topsoil depth 1 0'

7

1293 3

...s matrix (which is approx
... slightly plastic fines
... permeable, very stiff glacial till

...his area has surface water seeps

1297 4

...e matrix (which is approx
... fines)
... permeable, medium ...

... matrix (which is approx
... low plasticity fines)
... permeable, very stiff glacial
... (ML-CL)

Water seepage ... 5'

1316 3

... matrix (which is approx.
... slightly plastic fines)
...rmeable, stiff; glacial till.

9/?/79

MILLBROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
CHENANGO COUNTY, NEW YORK
LOGS OF TEST HOLES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

A. H. CURTIS

2

WILL [illegible] WATERSHED PROJECT
SITE [illegible]
SUMMARY OF QUANTITIES
FINAL PAYMENT

Bid Item No. 1	Mobilization Unit Price - $32,[illegible]	Total Quantity - 1 JOB Final Cost - $32,[illegible]
Bid Item No. 2	Clearing, Class 3 Unit Price - $1,500.00	Total Quantity - 2.5 Acre Final Cost - $3,750.00
Bid Item No. 3	Clearing and Grubbing Unit Price - $2,[illegible]	Total Quantity - 3.4 Acre Final Cost - $6,800.00
Bid Item No. 4	Removal of Water Unit Price - $5,[illegible]	Total Quantity - 1 JOB Final Cost - $5,[illegible]
Bid Item No. 5	Excavation, Common, Type A Unit Price - $2.00	Total Quantity - 10,158 C.Y. Final Cost - $20,376.00
Bid Item No. 5A	Excavation, Common, Type A Unit Price - $1.00	Total Quantity - 1,487 C.Y. Final Cost - $1,487.00
Bid Item No. 5B	Excavation, Common, Type A Unit Price - $2.00	Total Quantity - 371 C.Y. Final Cost - $742.00
Bid Item No. 6	Excavation, Common, Type B Unit Price - $2.00	Total Quantity - 1,500 C.Y. Final Cost - $3,000.00
Bid Item No. 6A	Excavation, Common, Type B Unit Price - $2.00	Total Quantity - 145 C.Y. Final Cost - $290.00
Bid Item No. 7	Excavation, Common, Emergency Spillway Unit Price - $1.20	Total Quantity - 73,813 C.Y. Final Cost - $[illegible].60
Bid Item No. 7A	Excavation, Common, Borrow Areas A&B Unit Price - $2.23	Total Quantity - 19,473 C.Y. Final Cost - $43,425.94
Bid Item No. 7B	Excavation, Emergency Spillway, Rock Unit Price - $10.00	Total Quantity - 17 C.Y. Final Cost - $170.00
Bid Item No. 7C	Excavation, Common, Sediment Pool [illegible] Unit Price - $1.20	Total Quantity - 1050 C.Y. Final Cost - $1,260.00
Bid Item No. 8	Access Road Unit Price - $3,000.00	Total Quantity - 1 JOB Final Cost - $3000.00
Bid Item No. 9	Earth Fill Unit Price - $0.40	Total Quantity - [illegible] C.Y. Final Cost - $35,[illegible]
Bid Item No. 9A	Earth Fill Unit Price - $0.40	Total Quantity - 436 C.Y. Final Cost - $174.40
Bid Item No. 10	Earth Fill, Structure Backfill Unit Price - $1.00	Total Quantity - 1309 C.Y. Final Cost - $1,309.00
Bid Item No. 11	Drain Fill Unit Price - $15.00	Total Quantity - 1807 C.Y. Final Cost - $27,[illegible]
Bid Item No. 12	Salvage & Spread Topsoil Unit Price - $[illegible]	Total Quantity - [illegible] C.Y. Final Cost - $10,[illegible]
Bid Item No. 13	Concrete, Reinforced, Cl. 4000 Unit Price - $[illegible]	Total Quantity - 37.2 C.Y. Final Cost - $10,[illegible]
Bid Item No. 13A	Concrete, Reinforced, Sub-Class 4000 Unit Price - $[illegible]	Total Quantity - 9.7 C.Y. Final Cost - $2,[illegible]
Bid Item No. 14	Concrete, Non-Reinforced, Class 4000 Unit Price - $70.00	Total Quantity - 15.4 C.Y. Final Cost - $1,078.00
Bid Item No. 14A	Concrete, Non-Reinforced, Sub-Class 4000 Unit Price - $[illegible]	Total Quantity - 10.1 C.Y. Final Cost - $[illegible]
Bid Item No. 15	Steel Reinforcement Unit Price - $0.30	Total Quantity - [illegible] lbs. Final Cost - $1,[illegible]
Bid Item No. 16	Reinforced Concrete Pressure Pipe, 30" Diameter Unit Price - $[illegible]	Total Quantity - 260 L.F. Final Cost - $20,[illegible]
Bid Item No. 17	Reinforced Concrete Pressure Pipe, 10" Diameter Unit Price - $50.00	Total Quantity - 24 L.F. Final Cost - $1,200.00
Bid Item No. 18	Asbestos-Cement Pipe, Conduits & Drains - 5" Diameter Unit Price - $5.00	Total Quantity - 485 L.F. Final Cost - $2,[illegible]
Bid Item No. 19	Loose Rock Riprap, Equipment Placed Unit Price - $[illegible]	Total Quantity - 155 C.Y. Final Cost - $3,550.00
Bid Item No. 19A	Modified Loose Rock Riprap, Equipment Placed, River Area Unit Price - $[illegible]	Total Quantity - 27 C.Y. Final Cost - $1,[illegible]
Bid Item No. 20	Bedding Unit Price - $14.00	Total Quantity - 97 C.Y. Final Cost - $1,[illegible]
Bid Item No. 20A	Modified Bedding, River Area Unit Price - $[illegible]	Total Quantity - 13 C.Y. Final Cost - $[illegible]
Bid Item No. 21	Water Control Gate, 10" Dia. Unit Price - $[illegible]	Total Quantity - 1 JOB Final Cost - $[illegible]
Bid Item No. 22	Miscellaneous Metal Work Unit Price - $[illegible]	Total Quantity - 1 JOB Final Cost - $[illegible]
Bid Item No. 23	Farm Field Fences Unit Price - $[illegible]	Total Quantity - 1019 L.F. Final Cost - $[illegible]
Bid Item No. 23A	Farm [illegible] Fences Unit Price - $[illegible]	Total Quantity - [illegible] L.F. Final Cost - $[illegible]
Bid Item No. 24	Vegetative Treatment Unit Price - $[illegible]	Total Quantity - 13.5 Acre Final Cost - $[illegible]
Bid Item No. 25	Mulch Tie-Down Unit Price - $[illegible]	Total Quantity - 13.5 Acre Final Cost - $[illegible]

Total Amount of Final Cost - $ [illegible]

Bid Item No. 15	Reinforced Concrete Pressure Pipe, 12" Diameter Unit Price - $43.00	Total Quantity - 340 L.F. Final Cost - $14,620.00
Bid Item No. 17	Reinforced Concrete Pressure Pipe, 15" Diameter Unit Price - $59.00	Total Quantity - 36 L.F. Final Cost - $1,206.00
Bid Item No. 18	Asbestos-Cement Pipe, Couplers & Drains - 6" Diameter Unit Price - $5.00	Total Quantity - 465 L.F. Final Cost - $2,325.00
Bid Item No. 19	Loose Rock Riprap, Equipment Placed Unit Price - $20.00	Total Quantity - 135 C.Y. Final Cost - $ 2,700.00
Bid Item No. 19A	Modified Loose Rock Riprap, Equipment Placed, Diver Area Unit Price - $49.00	Total Quantity - 27 C.Y. Final Cost - $1,323.00
Bid Item No. 20	Seeding Unit Price - $14.00	Total Quantity - 97 C.Y. Final Cost - $1,358.00
Bid Item No. 20A	Modified Seeding, Diver Area Unit Price - $31.00	Total Quantity - 33 C.Y. Final Cost - $1023.00
Bid Item No. 21	Water Control Gate, 8" Dia. Unit Price - $1,000.00	Total Quantity - 1 Unit Final Cost - $1,000.00
Bid Item No. 22	Miscellaneous Metal Work Unit Price - $2,000.00	Total Quantity - 1 Job Final Cost - $2,000.00
Bid Item No. 23	Farm Field Fences Unit Price - $2.00	Total Quantity - 1010 L.F. Final Cost - $2,020.00
Bid Item No. 23A	Farm Field Fences Unit Price - $2.00	Total Quantity - 520 L.F. Final Cost - $1040.00
Bid Item No. 24	Vegetative Treatment Unit Price - $1000.00	Total Quantity - 13.6 Acre Final Cost - $13,600.00
Bid Item No. 25	Total Bid Price Unit Price - $1000.00	Total Quantity - 13.6 Acre Final Cost - $13,600.00

Total Bid Price - $ 111,273.24

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE